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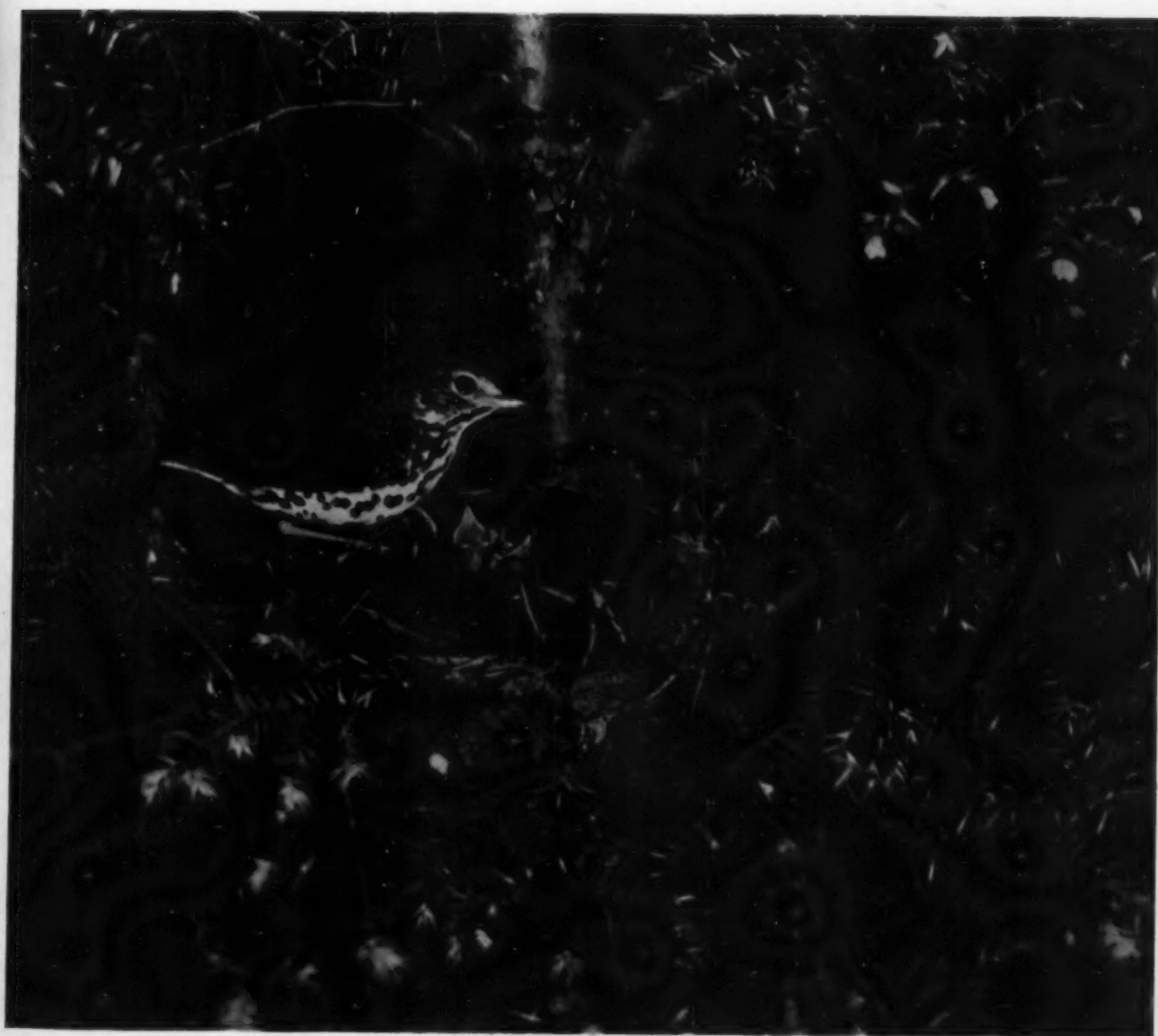
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CANADIAN GEOGRAPHICAL JOURNAL

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As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography — historical, physical and economic — of Canada, of the British Commonwealth and of the other parts of the world. It is the intention to publish articles in this magazine that will be popular in

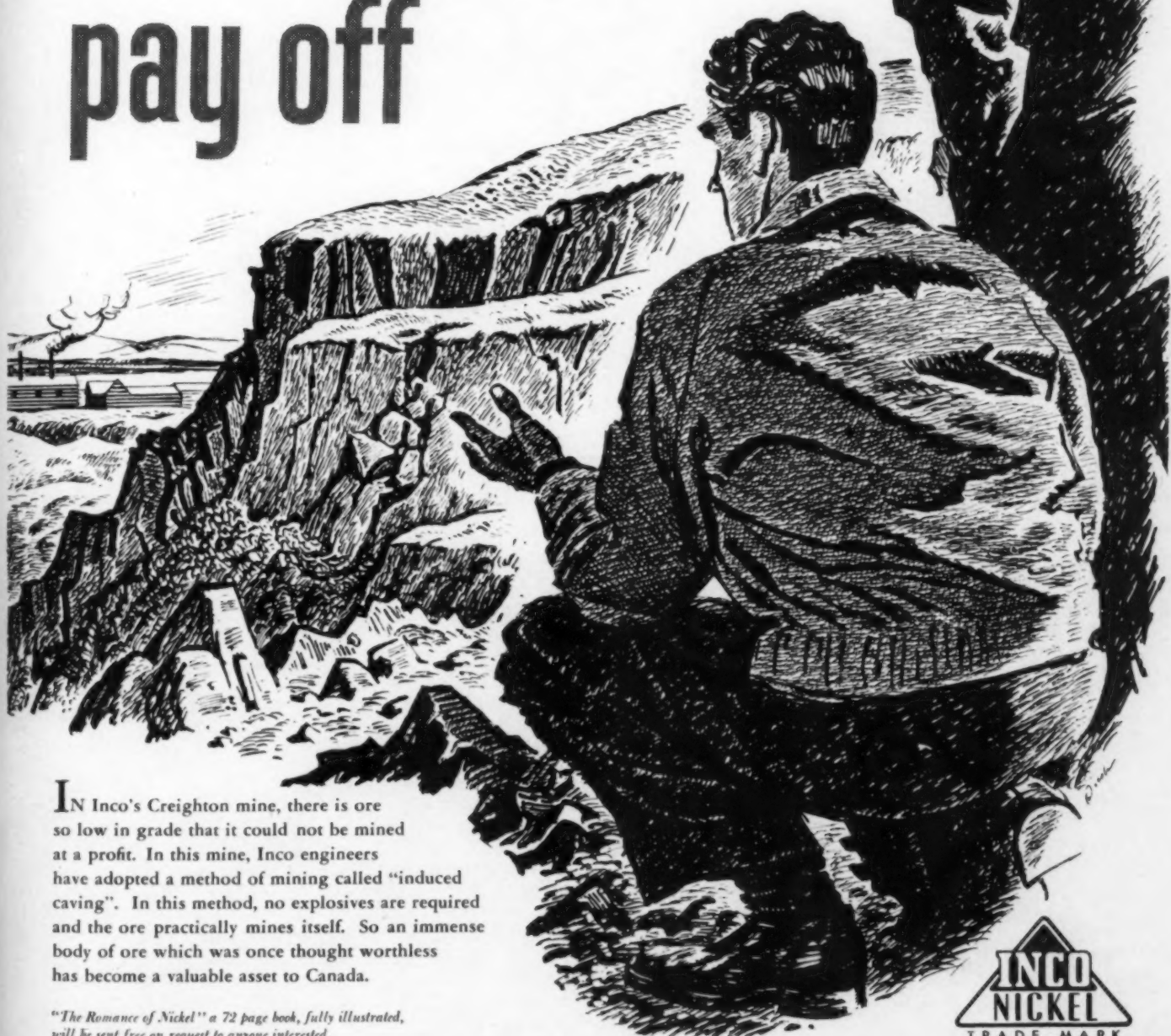
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Colour photograph by W. V. Crich.

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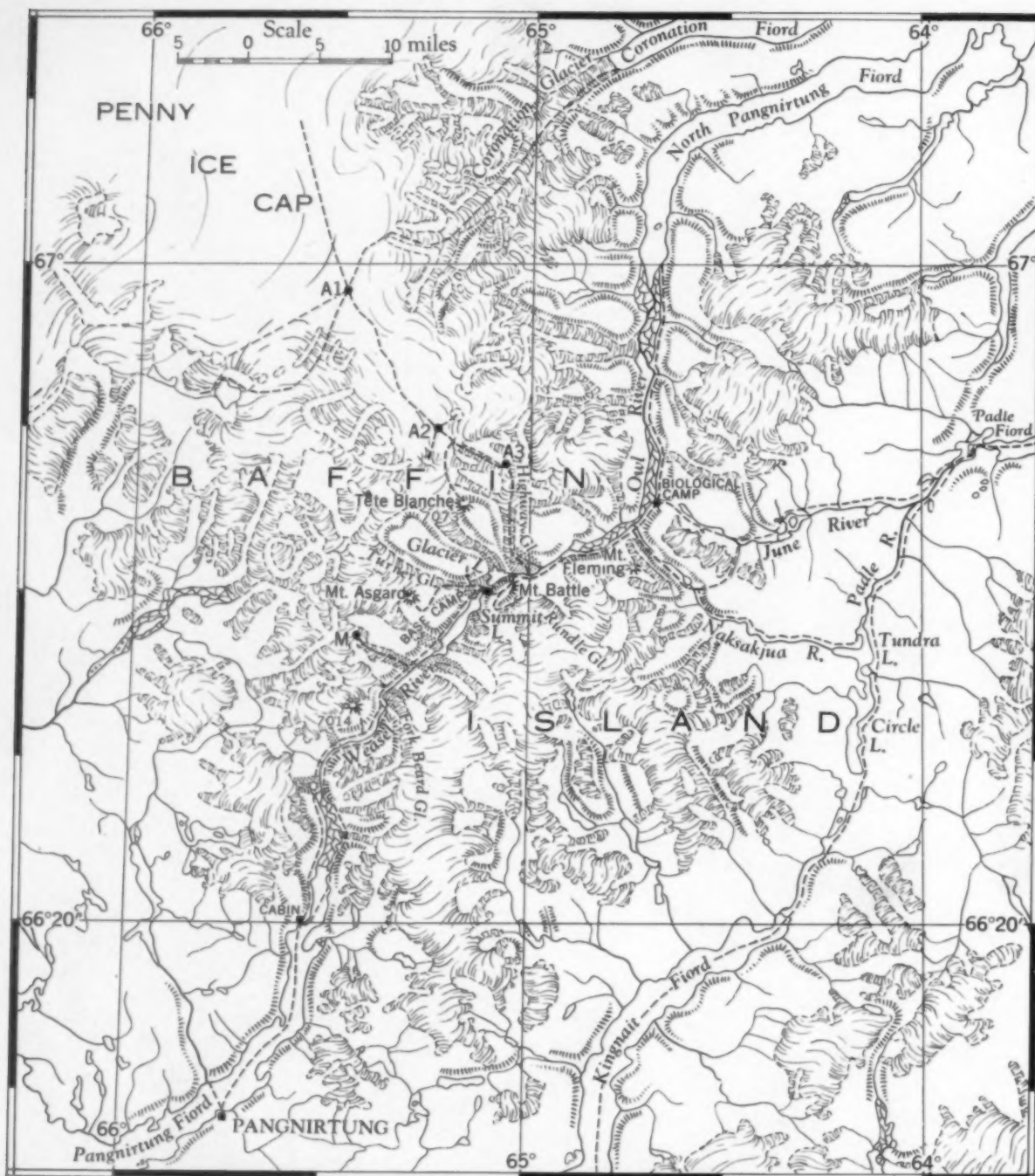
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Opposite:—These Indian children think irrigation begins at home. A study by Jitendra Arya, young Indian photographer who is receiving wide recognition for the excellence of his work
Camera Press from Miller.



Cumberland Peninsula of Baffin Island

by P. D. BAIRD

Map by courtesy of the Arctic Institute.

THIRTEEN men spent a cool summer in 1953 in the Cumberland Peninsula area of Canada's largest island. They were members of an expedition sponsored by the Arctic Institute of North America through Canadian

and United States Government funds, with the co-operation of the Swiss Foundation for Alpine Research and financial assistance from several organizations including The Canadian Geographical Society.



Baird and Schwarzenbach among the boulders of an old moraine near the base camp.

J. A. Thomson

This is one of the most spectacular districts of the Arctic. The eastern Canadian wishing to visit steep, glacier-hung mountains has three choices; he can go west to the Rockies, east to Europe or north to Baffin. All three are distant, the journeys expensive, but Baffin is the closest and has the attraction of being only partially explored with splendid opportunities for scientific research in many fields.

In 1950 the Arctic Institute had organized an expedition to the Clyde district of Baffin Island, which had been very fruitful of scientific results, particularly in glaciology. It seemed logical to devote a part of this next group's activities to the Penny Ice Cap, an ice cap as large as and considerably higher than the Barnes Icecap farther north.

The first known white man to sight Cumberland Peninsula was John Davis, who landed there in 1585 and named one of its highest peaks which overshadowed his anchorage Mount Raleigh, after the great adventurer who was then engaged with his settlement of Virginia. Since then its coasts and harbours

had become familiar to the whalers of Scotland and New England but inland little was known. A few scientific travellers had penetrated its wild peaks. The great German anthropologist Boas was there in 1883-4 and with native help produced an excellent map. In this century J. D. Soper and L. J. Weeks, both Canadian Government officers, had worked there, and in 1951 a Geological Survey party, under G. C. Riley, mapped its southern coast. These latter had been operating out of Pangnirtung, Baffin Island's "capital", where a typical Canadian Arctic settlement, consisting of Hudson's Bay Company, Royal Canadian Mounted Police, Anglican Mission and hospital, has been in existence for thirty years. Some five hundred Eskimos live in camps around Cumberland Peninsula and Gulf; the only other white settlement is the weather and radio station of Padloping on the northeast coast, operated in the summer of 1953 by a small detachment of the United States Air Force.

Through personal contact at the beginning and end of the expedition, and throughout by



The ski-equipped Norseman on the sea ice at Pagnirtung, about to take off on May 16th to establish base camp.

W. R. B. Battle

radio, we got to know the folks of both these "villages" well and their hospitality and kindness contributed much to the happiness of the party.

Our group consisted of thirteen men whose ages ranged from 41 to 21. These were:—

W. R. B. Battle, Geomorphologist, Cambridge and McGill University.

B. Bonnländer, General Assistant, McGill University.

D. J. Kidd, Geologist, Mackenzie Island, Ontario.

J. Marmet, Physiologist and Mountaineer, Swiss F.A.R.

S. Orvig, Meteorologist, McGill University and Arctic Institute.

H. Rothlisberger, Geophysicist, Swiss F.A.R.

F. Schwarzenbach, Botanist, Swiss F.A.R.

H. R. Thompson, Geomorphologist, Oxford and McGill University.

J. A. Thomson, Photographer, McGill University.

W. H. Ward, Glaciologist, U.K. Department of Scientific and Industrial Research.

A. Watson, Zoologist, Aberdeen and McGill University.

J. R. Weber, Geophysicist, Swiss F.A.R. and myself as leader and glaciologist.

Svenn Orvig, Hans Rothlisberger and Bill Ward had been on the 1950 party. Ben Battle and Fritz Schwarzenbach had had experience in Greenland, Hugh Thompson in Svalbard, and Adam Watson and Hausi Weber in Lapland, so we had considerable knowledge of arctic summer expeditionary technique among the members.

The great thing about most arctic scientific research is to be established well before the summer season begins. But when does it begin? In April we received a radio message from Pagnirtung that the local forecast was for spring four weeks ahead of normal. We speeded preparations as much as possible but personal

Pulling equipment from the landing site to base camp in May. Ben Bonnländer tries to prevent sunburn with a head mask.

W. R. B. Battle



travel commitments, exams and so on, precluded a start from Montreal before May 12th. On that date, by the courtesy of the Royal Canadian Air Force, a North Star aircraft took our people and two tons of personal equipment and scientific gear in two long smooth hops via Goose Bay to Frobisher, Baffin's only airport.

Waiting there was our ski-equipped Norseman, chartered from Arctic Wings Limited and piloted by Gunnar Ingebrigtsen and Dave Croal, two old friends from Churchill. The weather was certainly springlike and perfect for flying. In four trips we ferried to smooth landings on the fiord ice at Pangnirtung, taking as well long-piled-up mail, the Hudson's Bay manager at Frobisher for a few hours visit with his fiancée, and three sick Eskimo patients for a hospital outside.

Despite the hospitality of Pangnirtung we had to get our camps established and stocked so that the plane could leave. After two days of unpacking and sorting stores, many of which had been sent up by sea in 1952, we were ready to start, and on May 16th established Camp A1 on the Penny Ice Cap, and base camp (B) on Summit Lake of Pangnirtung Pass. One has to make quick decisions in a plane. What is the

CUMBERLAND PENINSULA OF BAFFIN ISLAND

high point of the ice cap all shining white and looking level from the air? Which of two lakes will be the better site for access elsewhere; water, shelter from wind, landing conditions now and later?

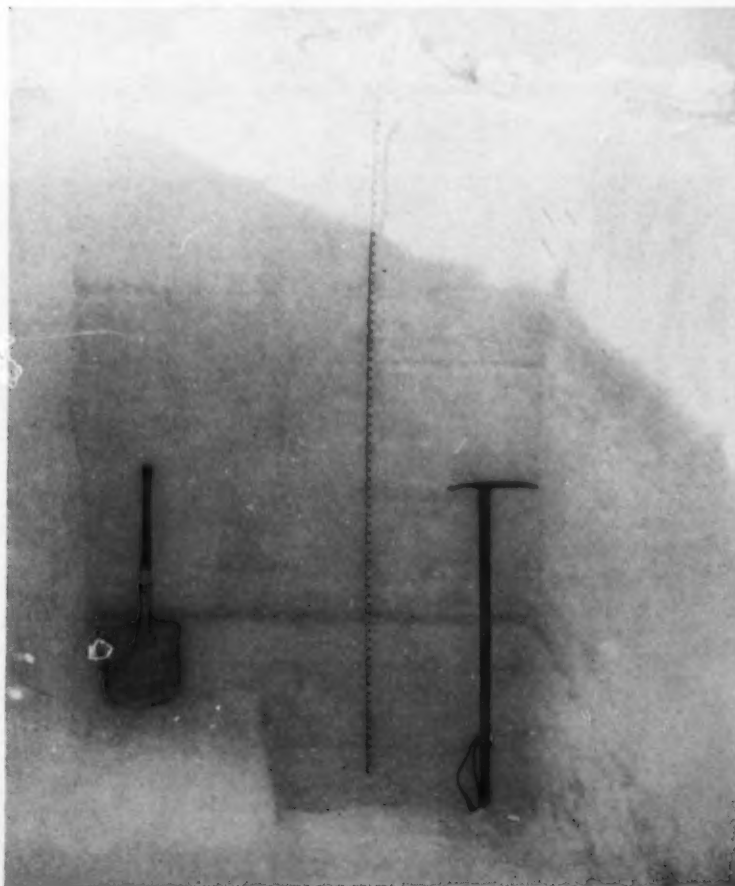
Four days later we put in another high camp between the first two, whence the Swiss seismic party would work downwards, and the zoologist and geologist got off to Padloping to start a dog team trip in the local fiords and islands. The weather stayed warm, almost too much so, as the fiord ice became very wet and began to thin, and cloud and low fog at times bothered the flying. We snatched fine moments to stock up the camps and then on May 25th took a flight around the ice cap. Next day the last loads and two caches, one in the mountains, the other for a low level biological camp, went in and before evening the plane was on its 15-hour flight home to Churchill.

With the end of this period the weather went sour and for nearly 30 days we had wind and snow with blizzards on the ice cap, and only occasional fine periods. It was a trying time when everyone wished to reconnoitre and start their scientific work. On the ice cap the measuring instruments were in, but many days



Camp A2 on the threshold of the Penny Ice Cap. Camp A1 is on the dome in the background, above tent door, eleven miles away.

Right:—The pit in the perennial snow at camp A1.
W. H. Ward





Summit Lake, with base camp at bottom right. In centre background is the mountain we referred to as The Queen.

W. H. Ward

had to be spent in the far-from-windproof tent huddled over the Primus stove while the temperature outside went down to 13 below zero F. on one occasion, and averaged only 10 to 11 above.

The Swiss group, after completing with difficulty their high level initial seismic soundings, moved further down the glacier towards base camp and set up a new camp on a rocky moraine at the foot of one of the great mountain walls. Here on a little ledge, even at this height (3,400 feet), eighteen species of higher plants were found.

The base camp had the most spectacular scenery. From 1,300 feet it looked southwest down the pass with mountains rising four, five, and six thousand feet above the floor. At the bend of the pass was a majestic peak which among ourselves we called "The Queen", 7,014 feet in height. To the north of base the

other half of the pass was dominated by a fantastic twin tower, Asgard Peak, so called because it looks like van Loon's illustration of the Norse gods' stronghold. A fine feat was accomplished by the Swiss members of the expedition who climbed this on July 13th. It is probably the most striking mountain in eastern North America. "The Queen" defied us at the first attempted ascent, but in late August a grand spell of weather enabled five of us to reach the summit directly up from the pass which it dominates. About twelve miles down the north valley was the biological camp, in an area overrun in 1953 with lemmings; several pairs of snowy owls nested by this wonderful food supply. To reach this camp Don Kidd and Adam Watson after their Padloping trip had to walk thirty miles and cross a 2,600 foot pass. This was heavy going as they ran into soft snow and got separated by making different plans to move their heavy loads; Adam had the tent, Don the food. We sent parties out from base to help them over, but even so it was a difficult time and none knew of Don's whereabouts for a couple of days. Eventually he turned up safely, but meanwhile my own start for the ice cap had been delayed. I need not have worried about the delay as it was still winter up there.

When I did go, visiting the Swiss camp on the way, I picked a really poor day. The route from the head of the Swiss glacier to A1 had been marked seventeen days before by snowmen at fifteen minute intervals, but they



The Swiss party setting off with heavy loads for the mountains.

J. A. Thomson



Panorama of the area round A3 camp on Highway Glacier where much of the seismic sounding was done. Camp site is against rock wall, climbed by Swiss, right centre.

J. A. Thomson

had weathered badly, and before I was half way visibility was down to 100 yards in a blizzard. Jurg had come half way with me but when he turned back the weather worsened and the guiding sun vanished altogether. I picked up snowman 13, missed 14, 15, 16, and stumbled luckily on 17, then 18 which was only twenty minutes from the camp. By now it was a thirty-mile-plus howling wind drifting the snow over ski tracks in a minute. I went on for twenty minutes, then for an hour up and down and cross wind, but not a sign of the camp did I see. I was tired after eighteen miles and 4,500 feet of ascent so the only thing to do was seek shelter and wait the weather out. I built a small igloo with most unusual tools, the back end of a ski and a table knife, and crawled in, out of the wind anyway, and into a comfortable sleeping bag. Thirst was my main discomfort and I took forty minutes to melt a cup of water over a candle, my only fuel supply. The temperature was about 14°

outside, 25° inside. I dozed a few hours, then on waking saw blue sky. There was still a lot of fog but the wind was down and after a few minutes outside a brief lifting showed me the camp 700 yards away. So this was my arrival, scarcely in the style I had intended.

It was another ten days before anything like summer appeared at this altitude, then a warm, calm, clear period began but still the air temperatures remained well below freezing. We were almost above the summer melt but lower down it was going ahead fast, glaciers running with water and flowers blooming in the valleys. Even mosquitoes began to give us their unwelcome attention in early July; they were particularly bad at the biological camp. Here Adam was having a great time with fifty young snowy owls, weighing some of them, checking their feeding and other habits, and dodging the attacks of the furious parents. Fritz was down there botanising and also across at June River and Tundra Lake in

The ground at camp A3 did not provide much comfort.

J. A. Thomson





Ward, Orvig, and Bonnländer evacuating camp A1 down Coronation Glacier.

J. Marmet

which has saddened all of us. Ben Battle, who had been working all the time out of base camp, was drowned in a pool on the moraine of the glacier right beside camp. Soon after my arrival there, and before the Swiss came back from Asgard, he went off alone for a day's walk. After a 28-mile hike, I had turned in early and it was only next morning, when the climbers and John had arrived, that we became alarmed. We searched all day and found his tracks sufficiently clear to be sure what had happened. Next day we dragged the pool and found his body. We buried him on the moraine overlooking the pass and the area in which he had carried out his last work.

The time was now approaching when I wished to go down to Pangnirtung to meet Dr. Wynne-Edwards who was coming up by Peterhead boat with mail, and to make arrangements with the Air Force, who had a squadron operating in the area, for assistance in evacuating some of our men and equipment. On the way down I hoped to spend four days or so climbing with the Swiss, so turned aside up to their high camp where we had put in a cache by Norseman on May 26th. But the weather turned miserable and we merely huddled in a tent for the four days while clouds hid the peaks and rain and wet snow came down.

On arriving at Pangnirtung I had a long wait. Don Kidd had come down to accompany the police motor boat patrol to Padloping but they

Kingnait Pass, the latter being apparently a very favourable plant locality.

By about July 7th the seismic party had worked well down their glacier and took a spell off from dynamiting. As mentioned, they achieved the memorable ascent of Asgard at this time. I left the ice cap on July 12th, meeting Bill Ward, who was taking my place, part way down towards the base camp.

It was the next day that a tragedy occurred



Asgard and Turner Glaciers seen from Mount Battle.

W. H. Ward

CUMBERLAND PENINSULA OF BAFFIN ISLAND

were turned back by ice at Cape Mercy, and eventually he had to walk over by the forty mile Kingnait Pass. John Thomson was also down and went photographing on a hunt for white whales with the Eskimos: this is quite an important local industry, the hides being shipped to England for manufacture into boot laces.

Finally Wynne-Edwards appeared and after a further delay making arrangements by radio with the Air Force I returned inland with the mail, which was welcomed by all hands. The Swiss had now completed their seismic operations on Highway Glacier and the heavy geophysical equipment was on the shore of Glacier Lake a short way from base. Then came a busy time. Benny and Jurg had gone up to the ice cap to evacuate the camp, and with Bill and Svenn started the 28-mile sledge journey north down Coronation Glacier on August 10th. Pulling 800 pounds they travelled hard and in two and a half days reached the sea where they found much floating ice and despaired of an aircraft getting in.

But it did; an RCAF Canso came in the very next morning and managed to pick them up and fly them to Summit Lake. Meanwhile, we at base had been working furiously, with a half useful rubber boat (one punctured side filled with three air mattresses) to transfer equipment from the far side of one lake to the other lake and be ready for the Canso. We just made it and on August 13th much of our heavy

gear was back in Pangnirtung, leaving us only a dozen loads to pack down when the final moment came.

A last visit was made to the biological camp and to June River for Adam to check up on his owls. As August continued remarkably warm, glacier melt streams continued to give trouble, though not as much as in July when several members of the party had duckings.

The rest of us now at base camp concentrated on finishing off sections of our uncompleted work. It was still necessary to do more survey work to tie in the mountain summits accurately and this required the bigger of the two theodolites and fine weather, for which for some time we waited in vain.

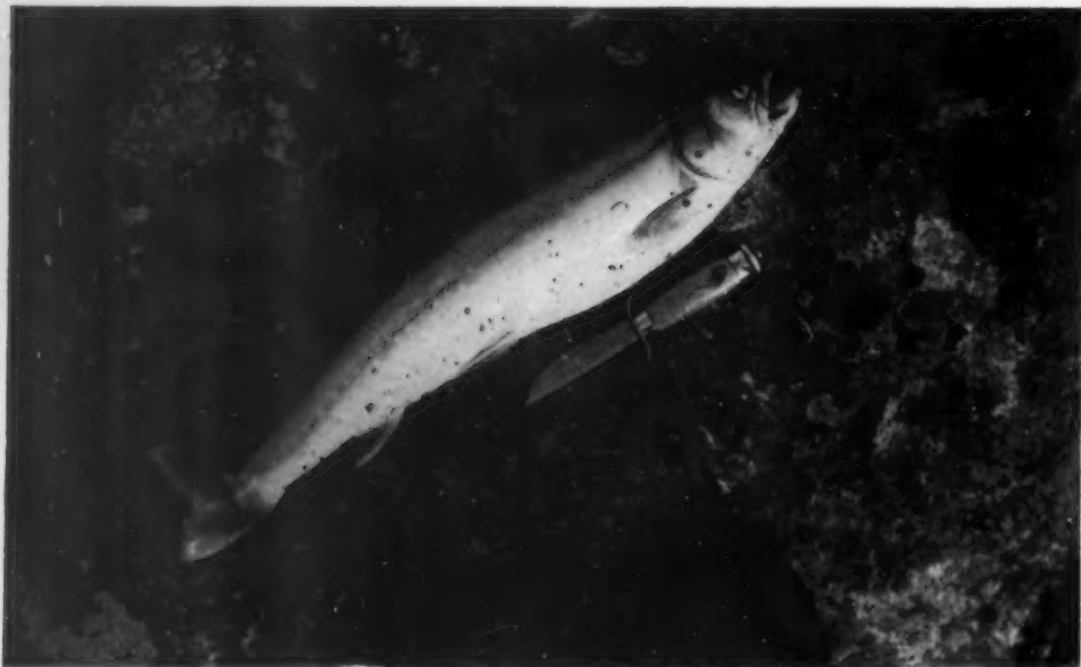
But at last we got our weather break at just about the time when the *C. D. Howe* called at Pangnirtung on its way north. Wynne-Edwards was given a lift by the vessel's helicopter a short way up the pass and walked on the remaining distance to join us. But he was alone: no natives were available to help back-pack our equipment out as a recent 'flu bout had left them all rather weak. We had therefore to prepare a cache to be brought out at the first opportunity and carry what we ten could ourselves.

Jurg and I left first, determined to have at least three days available en route to climb "The Queen". It was about fifteen miles to the foot of the mountain and we made all except one mile of this on the first day,

The RCAF Canso picking up the sledge party in Coronation fiord.

J. Marmet





*A good specimen of
arctic char.*

*A snowy owl attacking.
The adult owls made
great efforts to protect
their young when in-
vestigations were being
made at the biological
camp.*



*One of the young
snowy owls that
Adam Watson kept
under observation.*

J. A. Thomson photos

CUMBERLAND PENINSULA OF BAFFIN ISLAND

when at least my muscles could take no more. Although our sleep was disturbed, since in the night the liner of the tent collapsed on us in near-suffocating fashion, we felt in good shape the next morning and were off at 5.45 a.m. with, as we knew, 6,600 feet of ascent to make and not too much advance knowledge of the difficulties we might encounter.

But we were lucky, both with weather and ground; a long rocky gully led to a scree covered traverse between steep cliffs which brought us to the upper snows. A few ice-steps to be cut, and two rock-climbing pitches that called for the rope, and we were on the small summit ice cap with the most wonderful views in all directions. After an eleven-and-a-half-hour day we were back at our little camp feeling triumphant.

Next day we shouldered our burdens again for the last lap and were relieved to meet up with Hans after a short way. Divided among three our loads were reasonable, and by four in the afternoon we were down at our cached canoe by the fiord side. Dropping Hans at the cabin where Fritz and Hugh were already in residence, Jurg and I pushed on to Pangnirtung, getting there just after dark.

The remainder of the party left base camp next day and, as the weather held fine, three of them also ascended to "The Queen's" peak. The four of us who were already down went up to meet them on their last day, so that the afternoon of August 29th saw an army of eleven men tramping down to the fiord head.

We had a week at Pangnirtung awaiting the ship which had gone unexpectedly far north, a week of packing and short trips around the village area.

Late on the evening of September 6th the *C. D. Howe* came in and we stumbled out in the dark over the seaweed covered reef to board her. A week later we were back in Montreal after an excellent passage.

It will be many months before the full results of our investigations get worked up. We have, however, in a rather limited new

area of huge Baffin Island studied exhaustively many branches of science. The glaciers here after a mid-nineteenth century advance are thinning appreciably: one can even spot large changes since 1948 when the area was photographed by the RCAF. The thickness, temperatures, accumulation and ablation of snow and ice were all measured in some detail from Camp A1 down Highway Glacier to its snout.

In zoology the most important work was done by Adam on the breeding snowy owls, a lucky opportunity of which he took full advantage.

Fritz was able to make interesting comparisons between the botany of these mountains and those of East Greenland where he had worked previously. In Kingnait Pass he discovered an old plant refuge from which many species have spread.

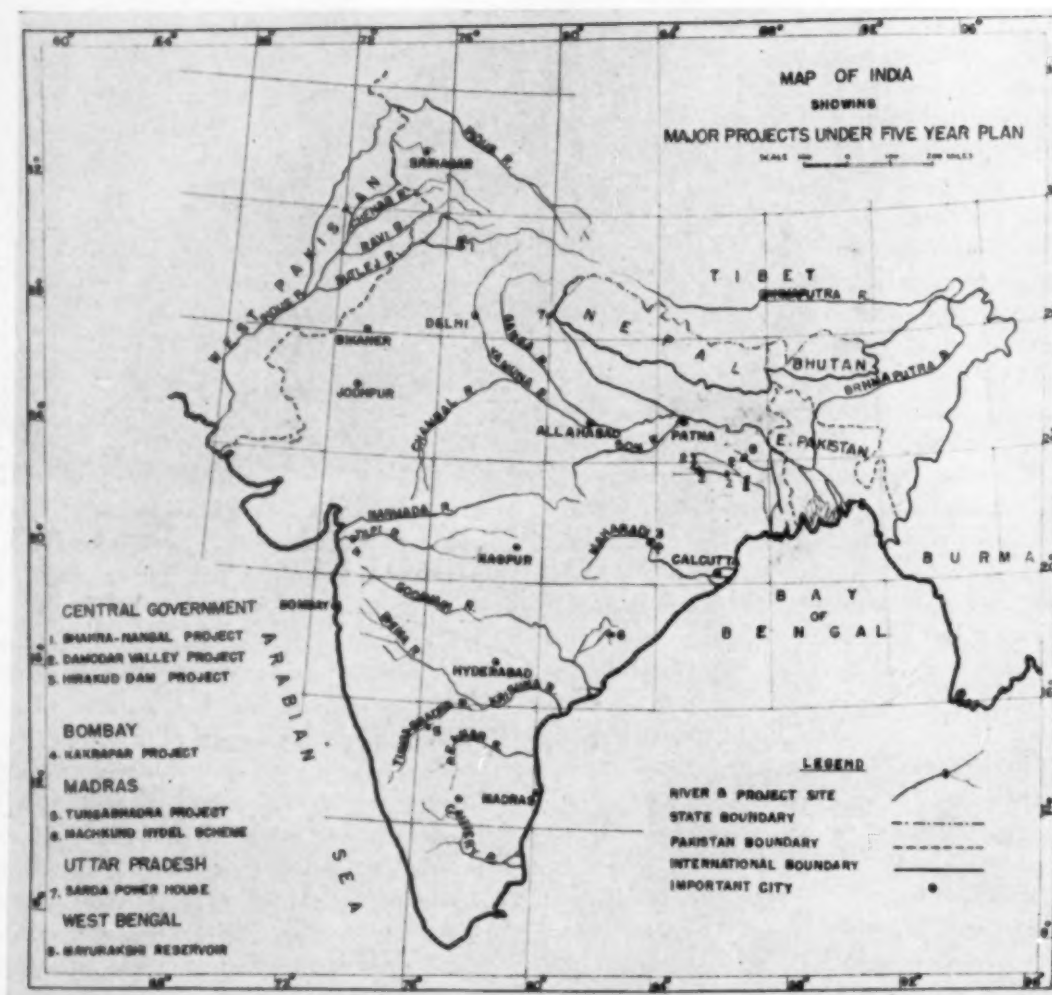
Don worked out the geology of Pangnirtung Pass which was composed mainly of rather barren granite gneiss, but an area of greater interest he found east of Padloping where presumed Tertiary volcanics were mixed with some more recent sediments, including coal. Hugh was another who covered the Pass from end to end while studying its physiography.

But our work though intensive in one area looks small when one contemplates the map of all Baffin Island. Those of us who love this type of exploration can be comforted by the thought that for years to come there will still be scope for new researches, new areas to tread.

Svenn Orvig in the tent at the ice cap camp (A1). The small radio, though only 2 1/4 watts, was once heard 640 miles away.

W. H. Ward





Map of India showing major projects under India's Five Year Plan. This plan provides for the execution of 102 projects spread over the country. Map, courtesy of Government of India Information Services, Ottawa.

Left:—Sir Arthur Cotton.



Irrigation and India's Food Problem

by R. M. BENNETT

SOME OF THE biggest engineering projects in the world are today being carried forward in India. Few people in the West envisage India as a great industrial potential although most of us realize her dependence upon agriculture. Hand in hand, expansion of agriculture and industry are forging

ahead. Indian workmen, naturally skilful, but never trained in modern techniques until recently, are assembling great steel structures. Young Indian engineers are proving that they can handle the most involved machinery and do it well: for a great dynamic, bloodless, non-communist revolu-

Photographs courtesy Government of India Information Services, except where otherwise stated.

IRRIGATION AND INDIA'S FOOD PROBLEM

tion is taking place in India. The revolution is against hunger, poverty, disease and ignorance. The initiative is Indian, the great proportion of the skill is Indian, the labour is Indian and most of the resources are Indian. Technical leadership, and some of the most modern machinery in the world are coming from the West under the Colombo and Point Four plans.

To most Canadians, India is a greatly over-populated country where a lot of people are perpetually hungry. India is not of necessity over-populated but there are always millions who are hungry. An underfed people are of themselves some of the best material communist revolutionaries could ever hope to secure. Apart from this, however, in the modern conception of the duties of the State it is agreed that it is the responsibility of any free country to make available to its people a reasonable amount of food at a rate commensurate with the income of the average man and that the amount should be sufficient at least to keep body and soul together. No one appreciates this duty better than India's present Central Government Cabinet

at New Delhi. They also appreciate that they have to spend about \$600 million annually in foreign exchange to Canada, the U.S.A., Australia and some other foreign countries for import of food grains, and that they cannot go on importing at this rate forever.

The actual lag between the bare minimum need in food grains and India's production is 10 per cent per annum or about five million tons. That margin of deficiency has kept prices at a level about 400 per cent of the 1939 value in food grains. Wages, particularly of the middle-class worker on a fixed income, have not kept pace with the increase in prices.

The normally accepted estimate of India's population is 361,000,000 and there is an increase of 5,000,000 per annum. Thinking only of this huge annual increase many generalizations follow, and one of them is that regardless of the benefits brought to India or developed in the land the rapid increase of population nullifies them. A look at some of the figures will correct this mistaken impression. The density of population

One of the great lead-off channels of the Nangal scheme—on the Sutlej River. Walls are revetted with stone in cement.



per square mile in India is 246 while that of Britain is 750, Belgium 708, prewar Germany 308, Italy 381 and Japan 426. On the basis of the ten-year figure the increase in India was only 13.4 per cent as against 14.5 per cent in the U.S.A. Whatever conclusion one comes to there can be no doubt the problem of the increase in population in India is one which needs serious study and subsequent action.

India's chief planners, however, are quite convinced that the problems raised are answerable and that the difficulty is not over-population but under-production and that given increased standards in health, and living, the trend to over-population will adjust itself.

There are several reasons for the food insufficiency in India. Some of them are his-

toric, others have been aggravated by recent world disorder; here are the main causes:

1. Sources of food grains previously open to India before World War II are now denied. Thailand, Burma, Indonesia, French Indo-China formerly contributed regularly with an exportable surplus of rice. Almost all those sources are now denied to India.

2. Continued drought has prevailed in a large section of South India. For six successive years the monsoon has failed, or nearly failed in the districts of Ramnad, Tinnevely, Madhura, Coimbatore, Salem, Arcot, Chittoor, Anantapur, Caddaph, and parts of Bellary and Kurnool and Guntur. These are not normally deficit areas and have a population that must be close to forty million people.

3. Partition of India following independ-

The Grand Anicut on the Cauvery River in South India. The dam is pierced by four batteries of sluices. The modern system is based upon Sir Arthur Cotton's nineteenth century scheme, but as far back as A.D. 200 the river had been dammed here.





The site of the Bhakra Dam on the Sutlej River system where there will be constructed a storage dam some 680 feet high. Nearly 3½ million acres of land will be irrigated by this scheme alone.

ence intensified the food problem for India as the larger part of the irrigated lands was allocated to Pakistan. There were about 33 million acres of land irrigated by state operated and controlled canals in North India prior to partition. About three-fifths of this went to Pakistan. East Pakistan is a great natural rice bowl which has rarely been affected by famine. Much of the Gangetic delta went into East Pakistan and was therefore largely denied to India as a source of food grains.

4. In order to get foreign exchange India has had to develop her resources in some products as tobacco, sugar-cane and jute. This has meant some of the best land in India being turned to exportable crops.

5. Absentee landlordism has been a plague through the ages, with about 80 per cent of the land owned by landlords who did not till

the soil and four-fifths of the land tilled by labourers who could never hope to own their own fields. This has never encouraged better farming in any land.

6. Fragmentation into small holdings, together with the curse of the money-lender and mortgaged land have cut down still further the capacity of the farm to produce.

7. Soil impoverishment and erosion are also very important factors in the food deficit.

8. Once the dreaded Kans weed gets a grip it will hold land barren for twenty years. A tall silver-plumed grass, it is beautiful to look at and deadly in its effect as its multiple roots destroy everything else in the area. Insect pests range from plagues of locusts to tent caterpillars and cause great damage.



At Bhakra which is north of Delhi on the River Sutlej system and in the rugged foothills of the East Punjab the river is being diverted through the two tunnels, one on either bank. Each tunnel is 50 ft. wide and half a mile long. This photo shows the face of a tunnel in the rock. By diversion of the River, the Bhakra Dam can be constructed.

Early stages in the construction of a wall to flank the Mahanadi River in the State of Orissa.





The railway and road bridge over the Mahanadi in the Hirakaud dam project. Before this great scheme could get under way it was necessary for road connections to be made and one of the great developments was this bridge, which opens an area previously difficult of access.

9. Rodents, monkeys, and an abundance of unproductive cattle have always been considered sacred and are responsible for as much loss per year in food grains and fruits as would meet the current ten per cent deficit.

10. Last but not least are the vagaries of the monsoon, floods and hurricanes. The coastal plains of India will somewhere each year get a cyclonic storm of terrific intensity. The ferocity and destructiveness of such storms, with winds reaching 110 miles per hour, have been witnessed by the writer. The total annual loss in this way is considerable.

These are some of the difficulties faced by the Government of India in ensuring the food supply of 361,000,000 people. In January this year, India's Prime Minister, Pandit Jawaharlal Nehru, inaugurating the Food Minister's Conference, said that the time had come to end India's dependence on food from abroad. This was of paramount importance and urgency since in the event of an international crisis such dependence could prove extremely dangerous for India.

There is no reason why India should continue to have a food deficit. Some of the difficulties outlined above are already being dealt with. Impoverishment of fields is being partially remedied by a great new fertilizer plant at Sindri, whose contribution so far has been to add food enough for another seven million. Fragmentation is being dealt with and absentee-landlordism has almost been eradicated. The depredation of rodents and monkeys is steadily receiving attention and the attitude of the people of the land towards these pests has undergone a radical change. But the problem is by no means finally answered. Perhaps not more than 43 per cent of India's arable land is now under cultivation. And yet with India's climate there is no reason why at least two crops per year, and in some cases even three, cannot be harvested — especially with the added advantage of irrigation.

Over most of India there is sufficient rainfall to warrant good annual crops, but the greater part of India receives 90 per cent of the annual rainfall in the three or four mon-

soon months. This results in quick run-off, floods, and erosion. The quantity of water that flows annually through India's rivers is enough to cover the entire area of the Indian Union to a depth of two feet. So far, less than two inches of this enormous quantity has been harnessed for food and power production.

The only permanent answer to India's food production problem seems to lie in the development of more and more irrigation facilities. Irrigation not only frees the cultivator from the vagaries of the monsoon but enables him to double and at times to treble his yield through repeated croppings.

Realization of the advantages of irrigation does not date from Independence in 1947. There are evidences of irrigation schemes in India that go back two thousand years. Modern development, however, is about a century old. The British Government turned over to the Indian people 55 million acres of irrigated land. This total is far more than all the rest of the world's irrigated lands combined.

The father of modern irrigation planning is Sir Arthur Cotton, a British engineer serving with the old Indian Army in the Corps of the Madras Pioneers (now the Madras Sappers and Miners, Corps of Indian Engineers). During the period of 1836-48, Sir Arthur and his group of Indian engineers planned and completed several great schemes in the Peninsula, including the Grand Anicut on the Cauvery River, the headwater schemes on the Godavari and

Krishna Rivers, and a smaller scheme on the Penneru. Flood control schemes and some irrigation were also carried out on the Mahanadi in Orissa. In modern times another great name has been added to the long list of devoted and skilled men who have given engineer leadership, and this is Shri M. Visveshvaraya of Mysore, now 90 years of age, but whose skill and knowledge are still in constant demand.

In the far north of India the five great Rivers of the Punjab, the Jhelum, Chenab, Ravi, Beas and Sutlej, have all been harnessed. More recently there was the great Sukkur Barrage in the Sind. These schemes converted the Punjab from a sandy waste to fertile fields and changed the entire face of the country. Most of this, however, has been allotted to Pakistan in partition.

The Ganges River basin has the Agra, Jumna, and Sarda systems. In all, about 25 per cent of India's pre-war cultivated land had the benefits of artificial irrigation. The amount was constantly being increased as numerous deep tube wells came into action and co-operatives were encouraged to plan more.

The total of land with irrigation from all types of sources in the Republic of India is now about 55 million acres. It is the intention of the Government of India to double this amount in fifteen years and their plans include spending three billion dollars on irrigation and power projects. More than 30 million kilowatts of electric energy will result.

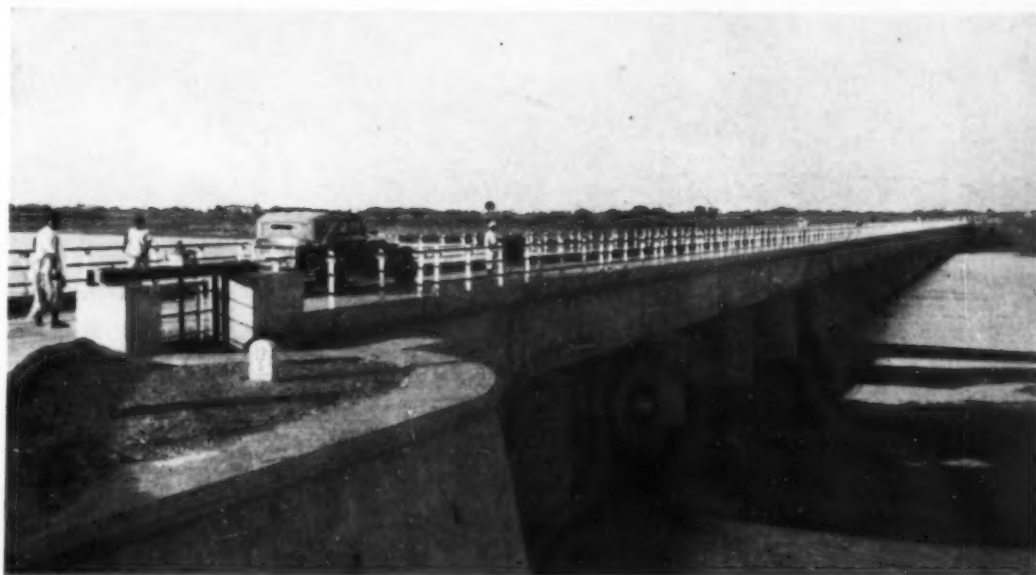


One of India's new industrial plans is the production of railway locomotives in West Bengal. Last year sixty were made. Many locomotives in use in India, such as this one, were made in Canada.

R. B. Gullison

The aqueduct on the Krishna River at Mopadevi, leading to the Avanigadda Island, about 300 miles north east of Madras City, permits irrigation of some 50,000 acres by doubling back a portion of the waters of the Krishna River over itself. This scheme takes advantage of the fall in land level above the sea to replace what was formerly one of the biggest pumping systems in the world.

R. M. Bennett



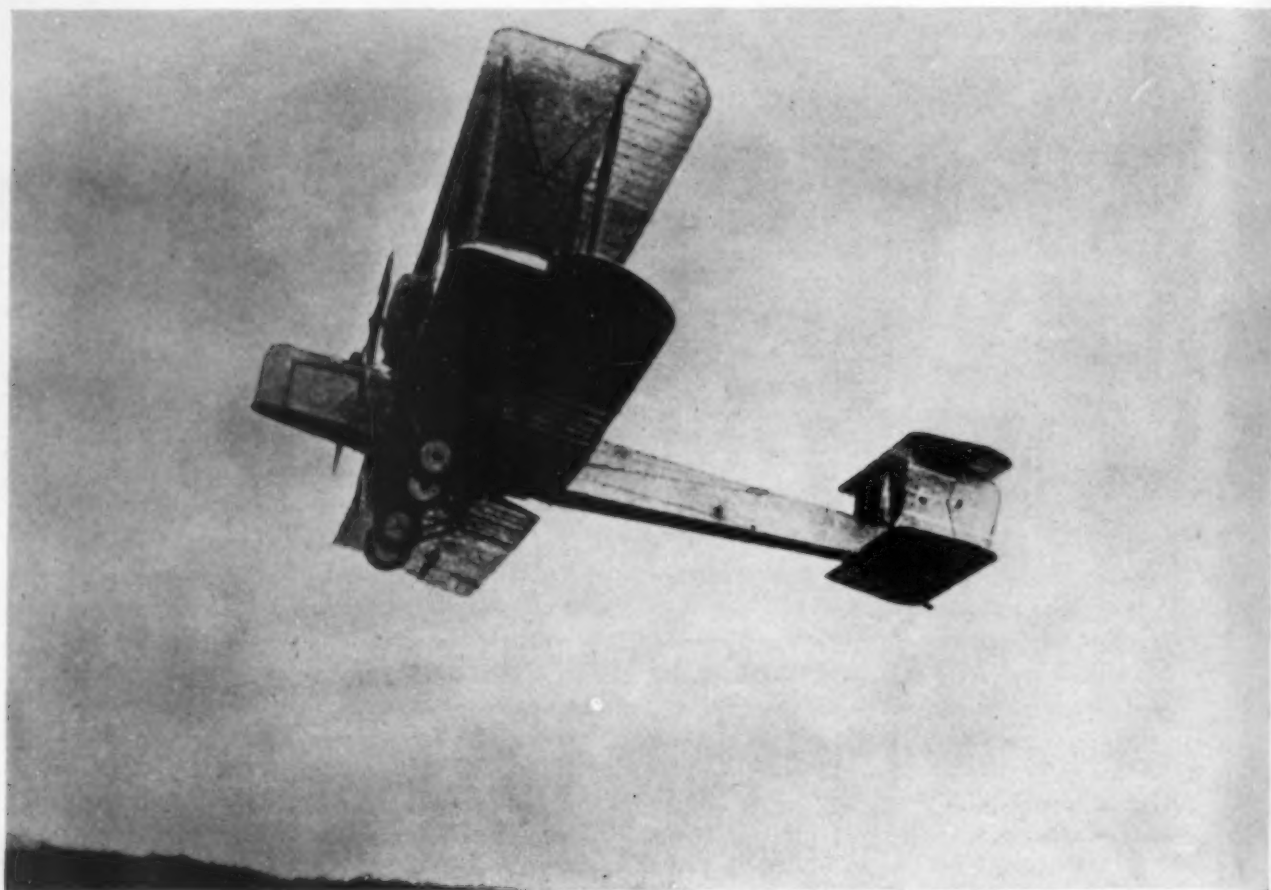
There are three major projects, amongst many, which deserve mention. These three projects should be completed by 1956 and will yield an additional seven million irrigated acres. First there is the Nangal-Bhakra scheme. After partition a great deal of East Punjab found itself without water for its canals and sadly lacking in electric power. The Sutlej River rises in the Himalayas northeast of Delhi. Where the river narrows to a gorge about 50 miles above Rupar near Bhakra a dam 680 feet high is being built — the world's highest straight gravity dam. About eight miles downstream there is a diversion dam and two hydro-electric power houses. Electricity from these houses is already reinforcing Delhi's over-taxed supply. The network of canals from these dams will provide irrigation for $3\frac{1}{2}$ million acres out of $5\frac{1}{2}$ million acres of arable land in the sections served. Before work on the main construction of the Bahkra dam could begin two gigantic tunnels each fifty feet in diameter and half a mile long and situated one on either side of the river had to be built. They are being lined with cement and should be completed by June 1953.

The second is the Damodar Valley project in Bihar and West Bengal. The Damodar is an erratic river; it meanders slowly or not at all in dry weather and in monsoon flood is a raging torrent. In 1943 the last great flood smashed through the embankments and dislocated all traffic from the northwest of India into Calcutta at a time when the Japanese were threatening India's eastern

seaboard. A statutory body known as the Damodar Valley Corporation and patterned after the Tennessee Valley Project has been formed and the necessary powers to implement the scheme have been granted. Both Bihar and Bengal will profit from the scheme. Four great dams are being built to hold back the floods. Power will be generated at all four dams and about one million acres of land will be irrigated in Bengal.

The third great scheme is the Hirakud on the Mahanadi River in the State of Orissa. It is intended to control floods, provide irrigation, develop power, permit of inland water transportation, and possibly develop a seaport in the delta. Here the main work, a gigantic dam 195 feet high and 15,748 feet long, is being built. Behind the dam will be a storage lake that has a shore line of more than 150 miles. There will be 650 miles of irrigation channels. Eventually twenty million acres of land will be irrigated from this project. As far as irrigation is concerned it is more than twice the size of the TVA scheme. It has one channel, now dug and cement-lined, big enough to float a battleship.

This is the beginning of a new age in India. It can be an age of very great advance. India is the acknowledged political leader in Asia. If we in the West have the courage of our convictions and the imagination to grasp this day of opportunity with sympathy and understanding by standing with India, it could mean the expansion of freedom and opportunity for a greater proportion of the world's population than ever before.



The twin-engined Rolls-Royce Vickers Vimy, with the British airmen Alcock and Brown aboard, makes a clean getaway from Lester's field, St. John's, Newfoundland, 14 June, 1919, at the start of the first non-stop transatlantic flight.

Vickers-Armstrong Ltd., London

The First Non-Stop Atlantic Flight

by FRANK H. ELLIS

Flying the broad Atlantic was not always the simple matter it is today. When Alcock and Brown made the first non-stop crossing, it was the death or glory road.

The thin mantle of fame is one of Destiny's gifts which all too frequently becomes threadbare with the passage of time, often to be cast aside and forgotten by the multitude, together with the deed for which it was bestowed. This is becoming increasingly true concerning the first non-stop flight across the Atlantic.

During a conversation with a young Air Force pilot in 1944, who was flying out of Newfoundland on ship convoy duty, I asked him if he ever gave thought to Alcock and Brown, as he himself flew far out over the vast

ocean wastes. After a brief silence, his reply was a bit staggering. He said, "No, I'm sorry, I don't know them, where are they based?"

This lack of knowledge in respect to the first non-stop crossing is shared by a large proportion of Canadians who have been born during the last two decades, whose knowledge of such flying begins with the daring and renowned flight of Charles Lindbergh made in May, 1927. Many older people also believe Lindbergh was the first pilot to fly the Atlantic in a single hop, whereas his splendid crossing was not made for eight years after the historic flight of the British airmen John Alcock and Arthur Whitten Brown in June 1919.

Even before August 1914 British and Ameri-

THE FIRST NON-STOP ATLANTIC FLIGHT

can airmen were planning and building aeroplanes in the hope of flying the Atlantic, but the outbreak of war put a sudden end to such endeavours. Immediately hostilities ended, efforts were renewed, and to add impetus to the materialization of such attempts, the London Daily Mail posted \$10,000 as a prize for the first successful non-stop Atlantic flight, east or west.

As prevailing winds blow from the American continent towards Europe, it was logical that participants would favour flight attempts in the same direction. For this reason, several British airmen vying for the honour, arrived aboard ship at St. John's, Newfoundland, in the spring of 1919, together with a number of huge crates containing their 'knocked down' aircraft.

The first to come were Pilot Harry Hawker and his navigator, Lieut.-Commander K. Mackenzie-Grieve, and the biplane on which they pinned their faith was a specially built, single engined Sopwith, aptly named the *Atlantic*. Two others who reached Newfoundland close on their heels from England were Pilot F. P. Raynham and his navigator, Commander Morgan. Their machine was a single engined Martynside biplane, named the *Raymor*.

Both aeroplanes soon were rigged at different points near St. John's, and as the airmen and their ground crews stayed in the Cochrane Hotel, much friendly rivalry existed. However, a gentleman's agreement was made that neither plane would take off without informing the pilots of the other.

By the middle of May, both aircraft were readied to go at short notice, but as weather reports continued bad, the airmen impatiently awaited clearer skies.

Then came disconcerting news. The three large American flying boats with which airmen of the U.S. Navy planned to fly the Atlantic by easy stages, via the Azores, had left Trepassey Bay, Newfoundland, on the first leg of their flight, which meant it was imperative for the British airmen to lose no time if they wished to beat the Americans across.

It is history of course, that the American flying boat, the N.C. 4, made the crossing, to

Plymouth, England, over a period of fifteen days, while her two sister aircraft, the N.C.'s 1 and 3 came to bad endings on the Atlantic before reaching the Azores.

In an endeavour to be the first to fly across the Atlantic, non-stop, or otherwise, the pilots of the *Atlantic* and the *Raymor* made immediate plans to take off, in spite of the continued bad weather reports.

Hawker and Grieve were the first to go, leaving Newfoundland at 3.40 p.m. on 18 May. Raynham and Morgan, attempting to take off in their heavily loaded Martynside, cracked up along the shore of Quidi Vidi Lake, and thus, although they received no injuries, were effectively eliminated from the race.

Radio equipment at that period was still in its infancy, and the Sopwith was barely out of sight of land, before the radio aboard went out of commission, and the airmen were thus completely cut off from any communication. As the world expectantly awaited news of their arrival in Ireland or England, alarm spread as the hour of their planned landing passed and no word came from them. Then as the hours spread into days, it was realized that calamity had befallen them, and finally they were given up for lost. So sure were officials that the airmen had perished, condolences were despatched to their relatives, one being from H.M. King George V himself.

Suddenly out of Scotland flashed the news that they had been rescued at sea by the Danish steamer *Mary*. Without radio, the captain had been unable to inform the world at large until the ship reached the Butt of Lewis, in the north of Scotland.

When the vanquished Hawker and Grieve reached London, they received a tremendous welcome from massed thousands at the railroad station. Their exploit had aroused the nation and they were the heroes of the day. Their wrecked Sopwith was salvaged at sea by the American ship *Lake Charlotteville*, to be taken to Falmouth, where it was put ashore. Later, taken to London, it was displayed on the roof of Selfridge's great store.

In the meantime, two more British airmen, pilot John Alcock and navigator Arthur Whitten Brown, had reached Newfoundland

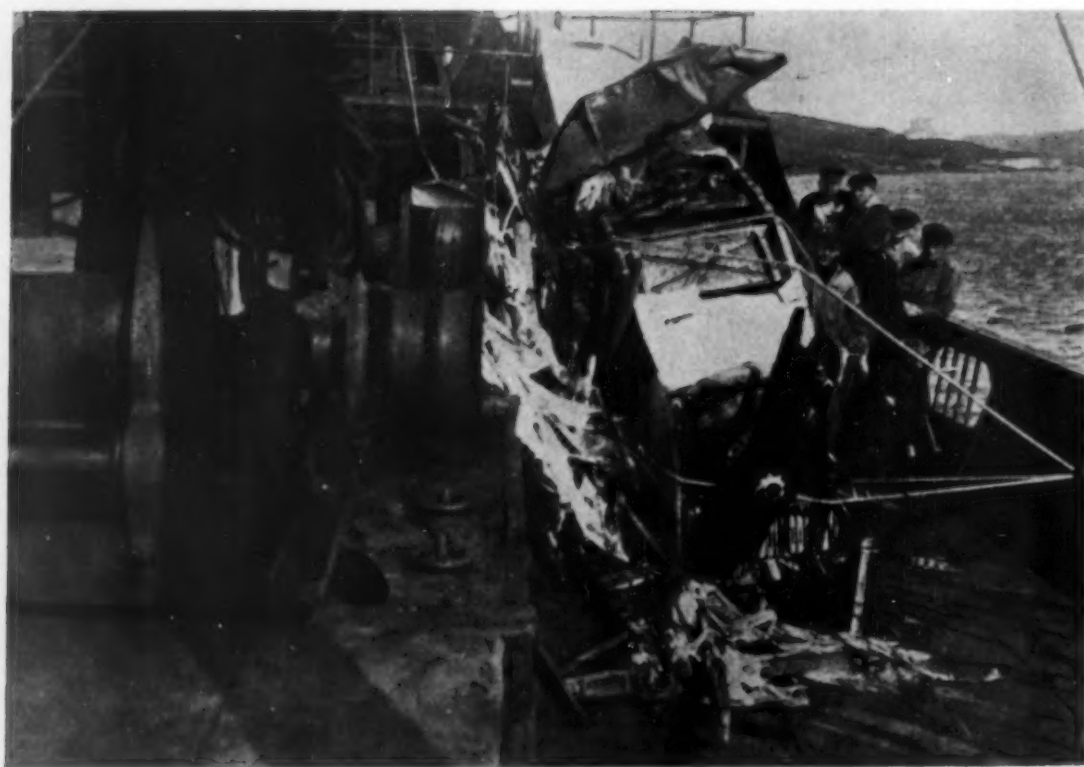


Left:—Pilot Harry Hawker (right) and navigator Lieut.-Commander K. Mackenzie-Grieve, wearing borrowed clothing, on their arrival in Scotland after their rescue in mid-Atlantic.



Below:—The American ship Lake Charlotteville with the rescued Sopwith plane in which Hawker and Mackenzie-Grieve were making their attempt to achieve the first non-stop transatlantic flight.

Photographs courtesy
Mrs. Mackenzie-Grieve

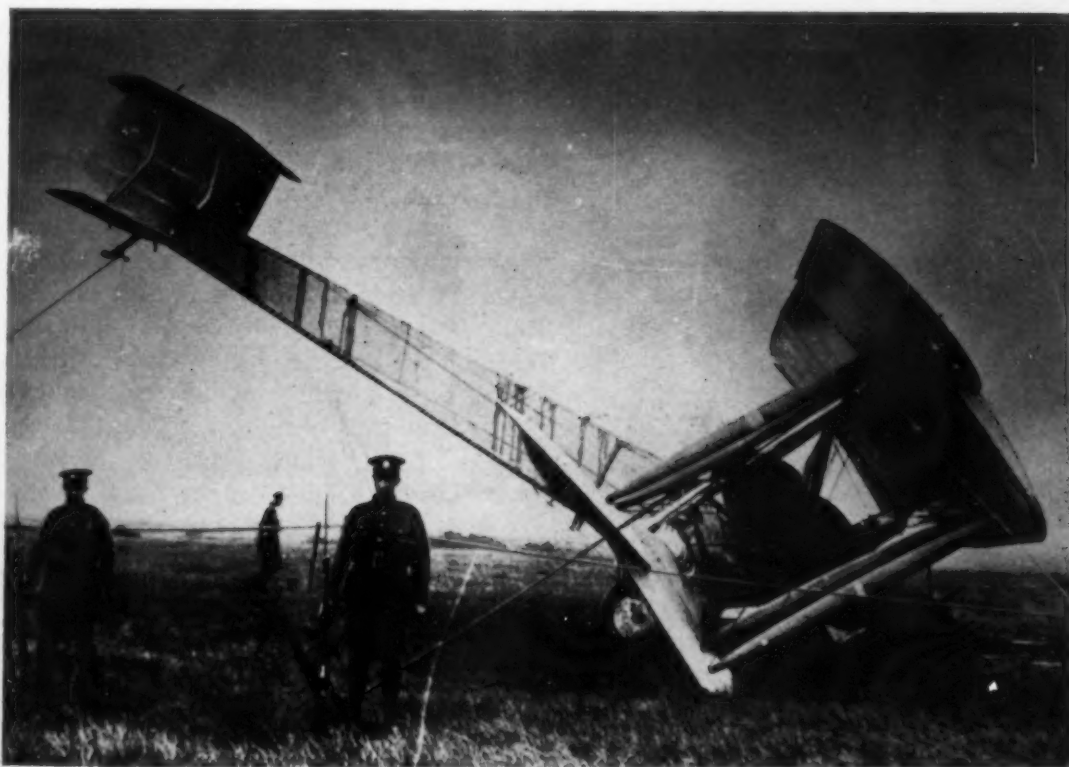
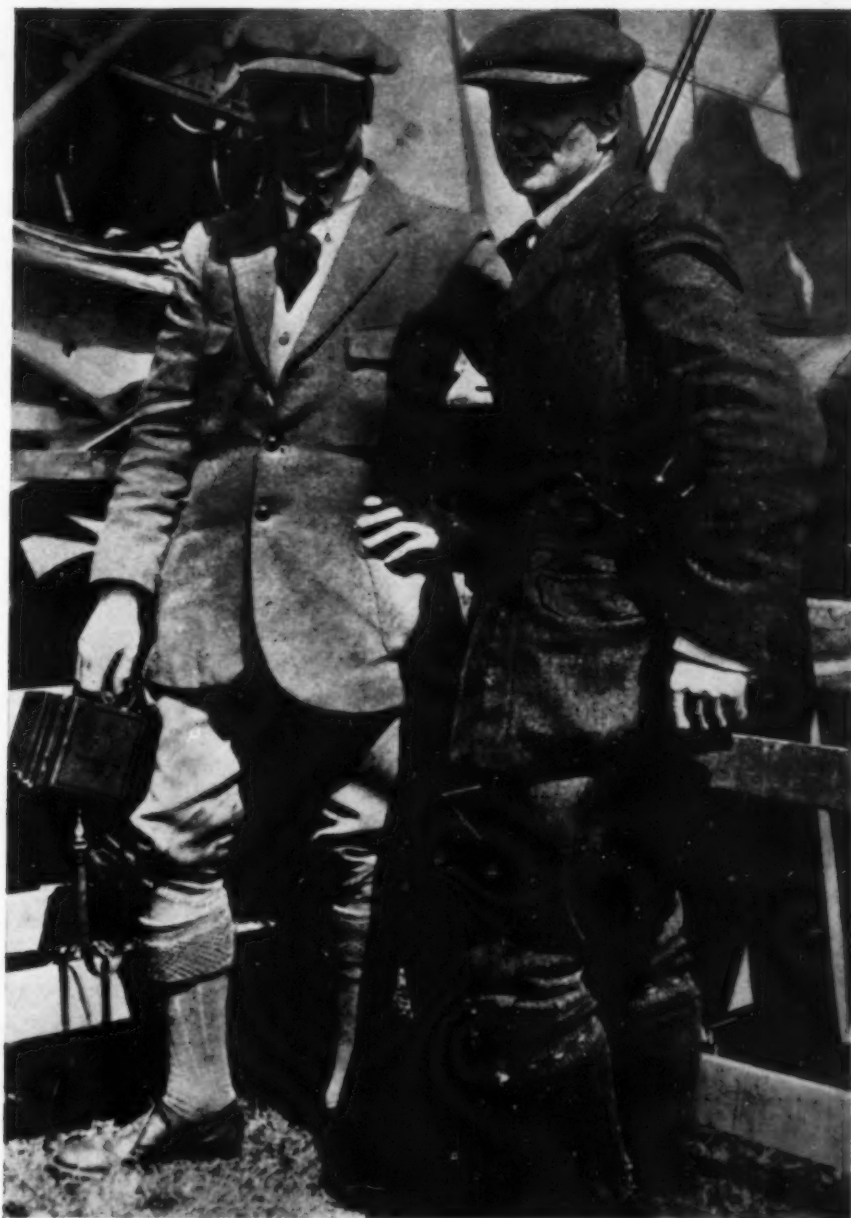


Right:—Pilot John Alcock (left) and navigator co-pilot Arthur Whitten Brown, first airmen to succeed in flying the Atlantic non-stop.



Guarded by soldiers, the damaged Vimy in which Alcock and Brown made their epoch-making flight across the North Atlantic rests forlornly in an Irish bog, her mission triumphantly accomplished.

Photographs courtesy
Vickers-Armstrong Ltd.





One of the envelopes salvaged from the Atlantic flown by Hawker and Mackenzie-Grieve after its forced landing in mid-ocean. A single specimen is today valued at more than \$500.

Mrs. Mackenzie-Grieve

Heading into the night was hazard enough, but in addition great masses of cloud were encountered, together with rain and boisterous winds. That they flew it the hard way can well be understood when it is recalled that in 1919 no aircraft was fitted with instruments for blind flying—reliable ones had not then

aboard ship, together with several huge cases containing the wings, fuselage, engines, etc. of a Vickers *Vimy* bomber biplane. The craft had been built for long distance bombing raids during the war, but had never been used for that purpose, its destiny apparently having been planned for something better than war, for this was the Rolls-Royce twin-engined aircraft which was to conquer the Atlantic, non-stop.

After the machine was rigged at St. John's only two test flights were made before the actual oceanic journey began. The start of the big adventure came on 14 June, 1919, when weather reports appeared good. The two airmen climbed aboard and the wheels of the stout *Vimy* left the soil of Newfoundland behind at 12.58 p.m.

Their radio, like the one used by Hawker and Grieve, also went dead before they were far at sea, and thereafter the world knew nothing of their plight or progress, until they were spotted crossing the Irish coastline, sixteen hours later.

Weather reports obtainable at that date could not be relied upon for complete accuracy. Climatic conditions over the Atlantic can change at short notice, and they ran foul of bad weather most of the way.

been developed, and the turn and bank indicator, so necessary to such flying operations, had not even been invented.

Most of the way across Alcock and Brown fought the elements with everything they had, lightning and rain badgered them continuously, and it should be remembered that they sat right out in an open cockpit. On one occasion during the night, their most perilous experience took place. Speeding along through the dense gloom, all sense of flying stability was lost, and they suddenly found themselves going down in a spin towards the hungry, storm tossed sea. It required the combined strength of both airmen on the dual controls to pull the *Vimy* back to an even keel. Alcock, in recounting the affair later, stated it was the nearest brush with death he had ever experienced. It must have been close, for he was an ex-pilot with years of war experience and knew what he was talking about.

When they reached Ireland, low hanging clouds enveloped the landscape and, although plenty of fuel remained in the tanks to reach English soil, discretion influenced them to make a landing at once, rather than take the additional risk of failure, since their goal had been reached.

After sixteen hours and twelve minutes in

the air, and with 1,800 adventurous air miles behind them, they set their *Vimy* down to a landing near Clifden, Ireland, on a deceptively grass covered bog.

As the four wheels of the heavy aircraft took the weight, they sank deeply into the mud, dragging the machine to a jarring stop, to finish up with its stub nose buried deep in the good Irish muck.

Alcock and Brown, unharmed, quickly made plans to travel to London, and upon their arrival they were met by a vast multitude of people, in a great demonstration of public acclaim. For their splendid accomplishment, they received the \$10,000 prize offered by the Daily Mail, but far exceeding that honour was their audience with H.M. King George V at Buckingham Palace, who bestowed upon each of them a Knighthood, together with awards of the Air Force Cross. It was the first occasion on which the coveted A.F.C. was awarded to any airmen.

Three hundred letters were flown across the Atlantic in the *Vimy*, and today the value of a single envelope is over \$200.

Of the four original airmen who attempted, or conquered the Atlantic in 1919, between Newfoundland and Ireland, none is living today. Hawker and Alcock died many years ago through aerial misadventure. Mackenzie-Grieve died in Victoria, B.C., in 1943, while Brown passed away at his home in Swansea, Wales, in 1947.

To commemorate the Alcock and Brown achievement, the Newfoundland Historical Society in conjunction with the Historic Sites and Monuments Board of Canada, have erected a stone memorial close to the spot from which the flight began. On the bronze plaque attached, a brief outline of the famous flight is inscribed. The unveiling of the monument took place in November, 1952, the ceremony being attended by the Lieutenant-Governor of Newfoundland, the Hon. Sir Leonard Outerbridge, Mr. C. E. A. Jeffery, of the Newfoundland Historical Society, and

The bronze plaque unveiled at St. John's, Newfoundland, in 1952, to commemorate the first transatlantic flight by Alcock and Brown.

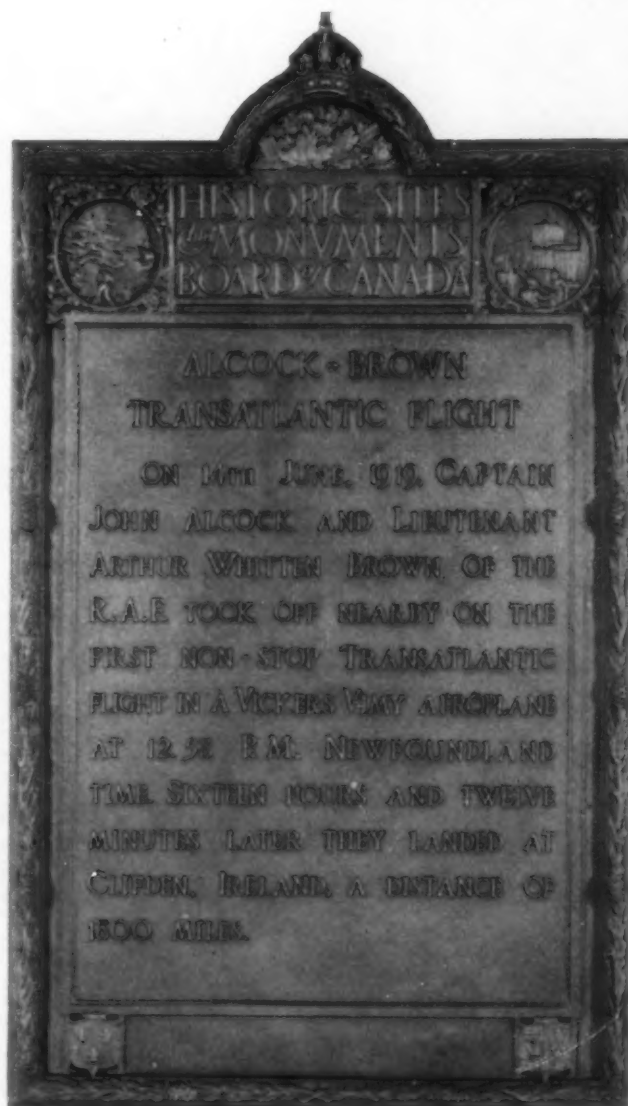
National Parks Branch

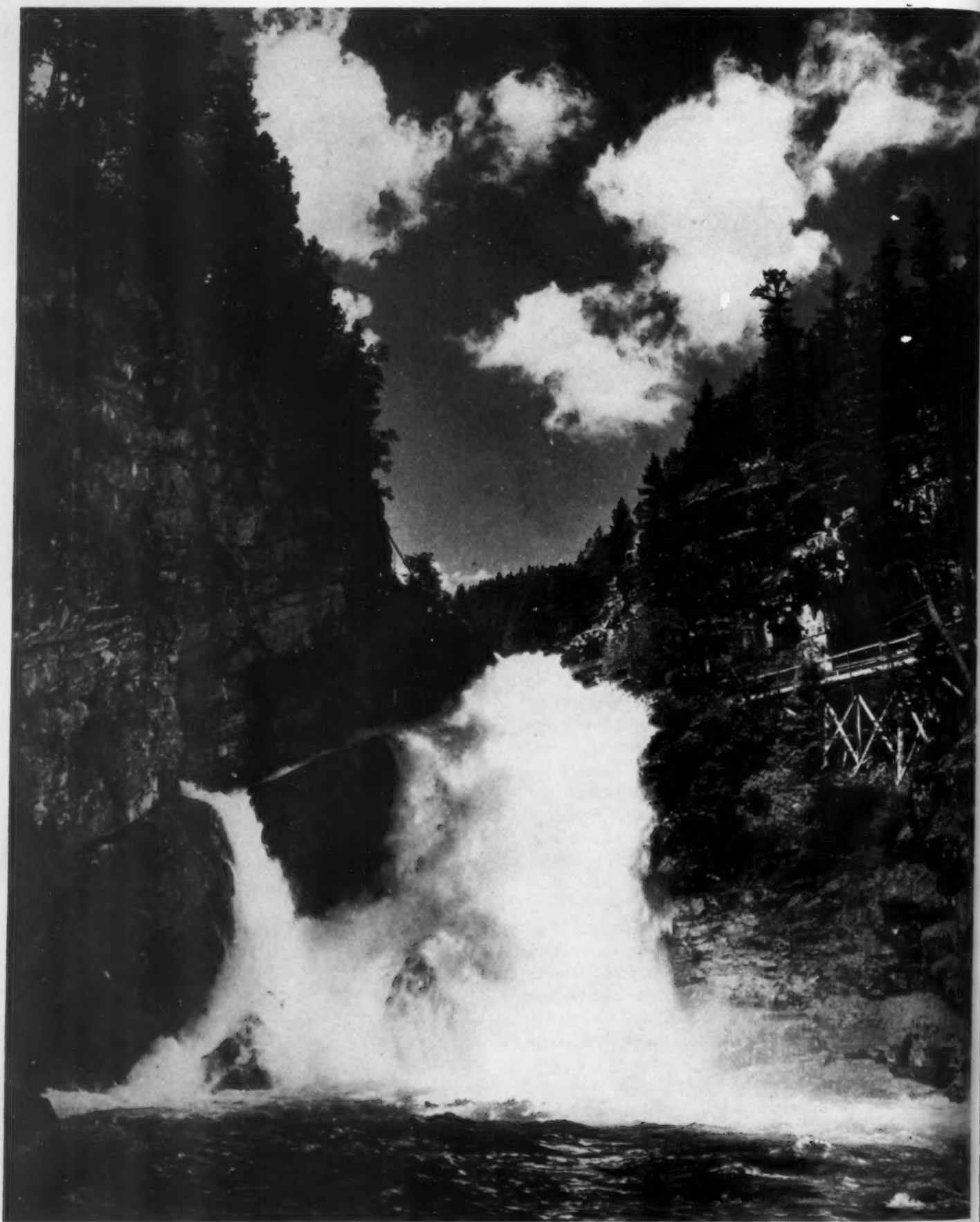
THE FIRST NON-STOP ATLANTIC FLIGHT

other dignitaries. A full guard of honour was mounted by members of the Newfoundland branch of the Air Cadet League of Canada.

Visitors to London may pay homage to the memory of two gallant airmen, by visiting the Museum at South Kensington wherein the sturdy Vickers *Vimy* has been placed on permanent exhibition.

The American airman and poet, the late Major Augustus Post, who for many years held the secretaryship of the Aero Club of America, composed a poem in expression of his admiration for Alcock and Brown, copies of which might well be placed in every airliner which flies the North Atlantic today. It would serve as a reminder to passengers and crew of the debt still owing to the pilots who pioneered the way, when the first attempts to conquer the wide Atlantic followed all too dangerously the death or glory road.

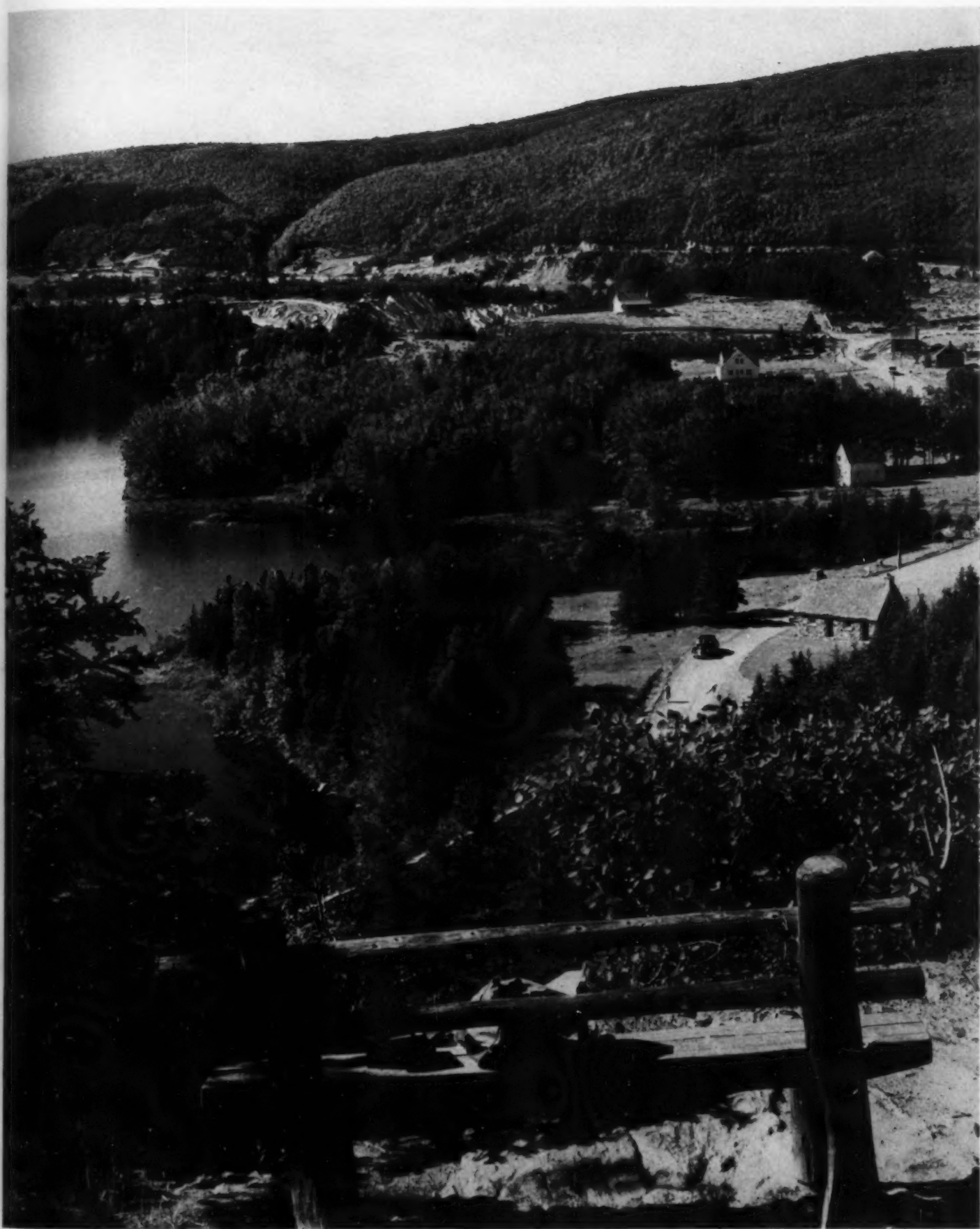




***Pictures of
the Provinces—I***

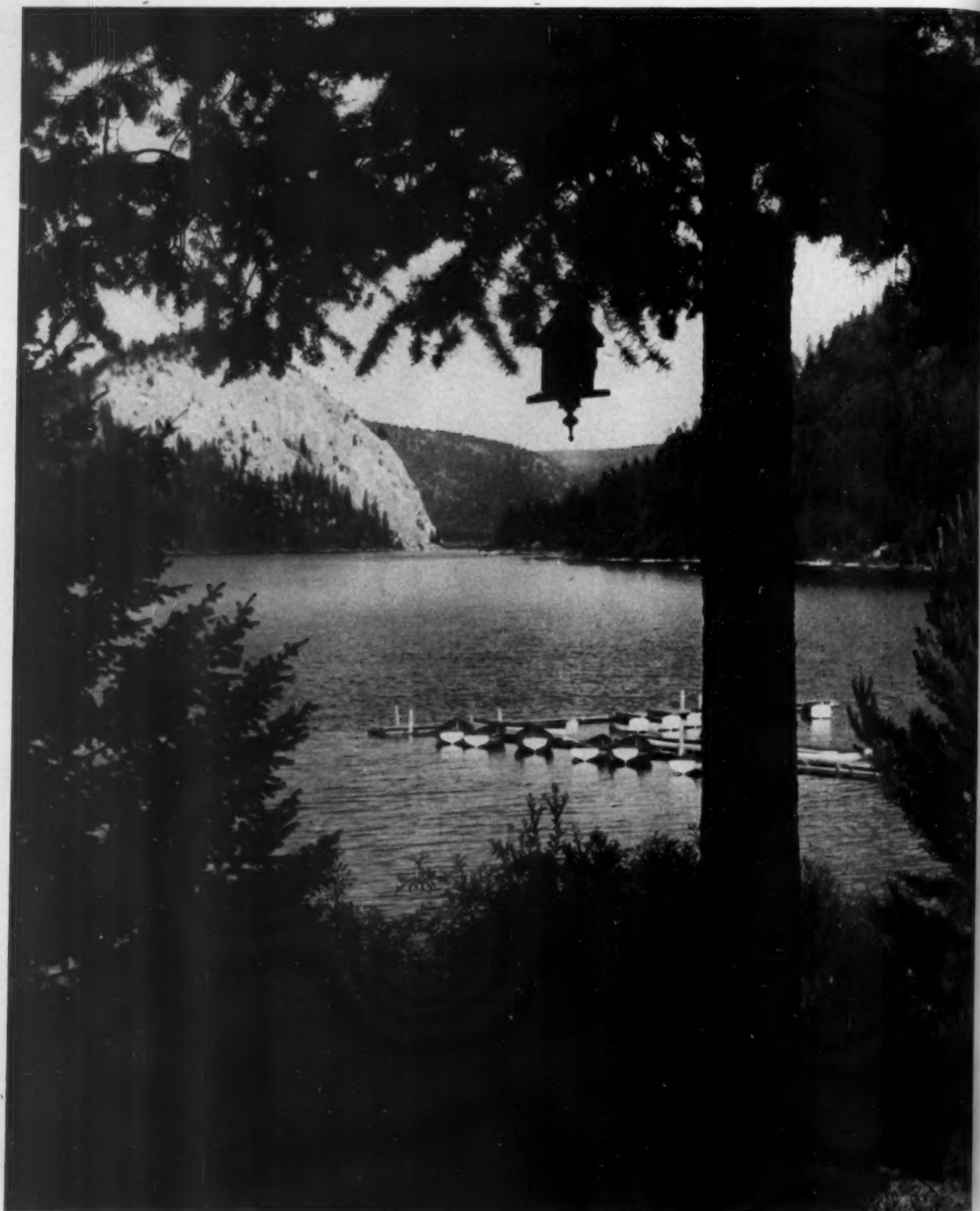
The falls of Cameron Creek tumble beside the Akamina highway in Waterton Lakes National Park. Near Cameron Falls, one of the finest cascades in this park on the southern border of Alberta, are several fish-rearing ponds surrounded by beautiful gardens.

Alberta Government photograph



Cape Breton, the Royal Isle of Nova Scotia, is a land of lovely lochs and shady glens, and kindly hospitable folk who can still speak in soft singing Gaelic and swing their ladies to The Flowers of Edinburgh. More people speak Gaelic in Cape Breton than anywhere else in the world and at St. Ann's is the only Gaelic college in America. The island has, too, a heritage from France, and in the Acadian villages, reminiscent of Brittany, French is spoken and many old customs of the eighteenth century are retained.

Nova Scotia Bureau of Information



Lakes are the sequins in the forest-green dress that sets off the natural beauty of British Columbia. This is Paul Lake near Kamloops in the interior, one of so many hundreds of lakes that the vast work of surveying and counting them is still uncompleted. They range from tiny sparkling gems to inland seas 100 miles long. Some still belong to the wild creatures, but many have become the favourite haunts of the British Columbian and his guests who fish, bathe, and sail the blue waters to their hearts' content.

British Columbia Government Travel Bureau



In the ancestral home in Quebec there are no eight-hour shifts. Work goes on from sunrise to sunset. The workers are gay, hospitable, charming. Their lives are patterned on the solid foundation of family life with its strong ties of kinship; social and economic life revolves around the hearth. In the Province of Quebec are many of the old French colonial houses, with their sturdy stone walls and protective wide eaves, some built in the early eighteenth century, which are passed down from father to son.

Quebec Provincial Publicity Bureau

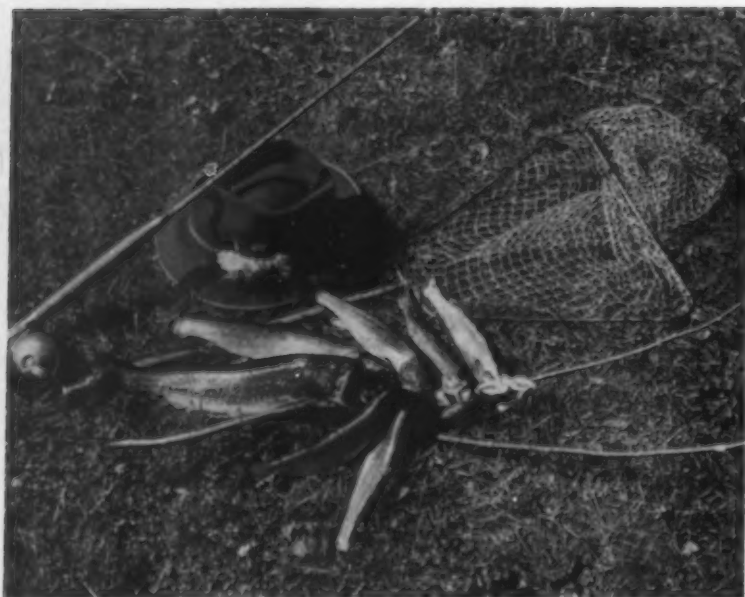


Trout fishing in Clyburn Brook in Cape Breton Highlands National Park.

Conserving Our Game Fish

by F. H. WOODING

NFB photographs, except where otherwise credited



THE GREEN DRAKE, tied to a No. 8 hook, floated gracefully downstream with the lively current, looking for all the world like a water-cruising Mayfly. Ahead of it, resting in the shady overhang of the bank, lay a four-pound cut-throat fresh from the sea. To the fisherman, standing wader-deep in mid-stream, the moment had arrived and he readied himself for the "rise" he was confident would follow.

A catch of speckled trout taken from the Miramichi River in New Brunswick.



In Banff National Park, Alberta, Bow Lake furnishes good sport.

When the dry-fly came within the trout's vision the fish showed no hesitation. In one sudden surge it arched upwards and with a roll that made its sleek back hardly break the surface of the water it seized the fly. The fisherman, mindful of the slender leader which joined fly to line, set the hook in a deft but firm movement and the battle was on.

The trout fought furiously for its freedom, with full, powerful rushes first to one end of the pool, then to the other. Three times it leaped above the surface, shaking itself in mid-air as it tried vainly to throw out the barb. But the fisherman, a man with uncountable numbers of trout to his credit, was used to the ways of the cutthroat and the issue was soon settled.

With great care the man eased the fish

closer to him and with equal care he lifted it from the water. For a moment, after releasing the hook, he admired his catch. Then, in an almost affectionate way, he gently returned it to the stream and its freedom. The day had been good—ten trout in all and every one a keeper. But this fish, like seven of the others he had hooked, was still alive; only two rested in his creel—the fish that would provide food for the evening meal.

A keen sportsman who thrilled to the excitement of a strong rise, this angler was also a good conservationist. To him the release of eight of the trout caught that day was simply common sense and if he thought about it at all it was only to remind himself that, with continuing luck, those fish would live to spawn and carry on their race. As for himself, what



Bringing in a tuna caught off Wedgeport, Nova Scotia.

F. H. Wooding

more could he ask? His angling day had been completely satisfying, his take sufficient to provide full plates for himself and his family that night.

Of the millions of anglers in North America—there are reported to be about 50,000,000 all told—too few have this same sense of sportsmanship. Yet never before in the history of this continent has there been a greater need for all-out efforts to conserve the sports fishery than there is today.

In 1952 close to 250,000,000 pounds of fish were taken from North American waters by anglers. To make this haul they invested nearly \$125,000,000 in a wide range of paraphernalia, from two-cent sinkers to \$300 imported fly rods. To this should be added the huge sums spent on outboard motors, boats, fishing licen-

ces and guides—not to mention the cost of transportation to and accommodation at the so-called "hot spots" with which this continent is so generously blessed. Your guess is as good as any what the cost might be of the average trout, bass, or salmon by the time it reaches the kitchen stove. But it is safe to say that by comparison filet mignon and other choice cuts would be considered cheap.

Today's sports fishermen, who have a great range of game fish to attract them, have been aided in their pursuit by forms of transportation unknown to earlier anglers. Aeroplanes, helicopters, trains, automobiles that can be converted into miniature hotels, all have helped to push the frontiers farther and farther back. The game fish of North America are threatened with an onslaught greater than



A fishing party with a string of pike caught in St. Lawrence Islands National Park, among the Thousand Islands.

ever before. For example, last summer three wealthy Americans arrived at Edmonton, Alberta, from Texas on their way to the Newhalen river, Alaska, nearly 2,700 miles north, merely to enjoy five days' rainbow trout fishing. They estimated a cost per man of \$1,000 for transportation, and \$100 a day after arrival. Even they admitted that this made the cost of trout very high.

The average person, of course, cannot afford such expensive trips and is forced to seek his angling in nearby waters. Nevertheless, those Texans were by no means unusual.

Every year great numbers of sportsmen travel long distances in their search for good fishing. The unspoilt and relatively unfished areas on this continent—from the Humber River, Newfoundland, to the Tlell River,



These boys fish off a dock at the mouth of the St. John River, New Brunswick.



The youngsters angling for catfish in the lower Fraser River valley of British Columbia are unusually well equipped, with good lines and worms for bait.

The aircraft mechanic caught his fine trout at Snare River in the Northwest Territories.

British Columbia, from Brooks River, Alaska, to the Platte River, California—now are readily accessible to those who have the time and money. There is no stretch of water that cannot be reached by the angler, for when regular airline or railway service ends a highly organized charter service takes over. Transportation companies today are offering specialized help in arranging travel, accommodation, guides and other facilities for anglers seeking new worlds to conquer.

International competition has come to angling. In 1953 teams from ten countries participated in the famous International Tuna Matches held each year at Soldier's Rip, off Wedgeport, Nova Scotia. Nearly as famous is the Tyee Club of Campbell River, British Columbia, whose membership also is made up of anglers from all parts of the world. Eligibility for membership is a tyee (perhaps better known as a "chinook" or "spring" salmon) of not less than thirty pounds and caught on regulation tackle under prescribed conditions. There are not many tyee button holders.

There are very few communities located close to fishable waters that do not sponsor annual competitions. There are prizes for the biggest small-mouth, large-mouth, pike, muskie, trout, salmon, pickerel and the like, and there are special divisions for both young and old. Prizes are usually worthwhile, ranging from automobiles, to trailers, boats, motors, and a wide assortment of fishing gear.

Fishery authorities and many conservation-minded sportsmen are viewing with alarm, however, the increasing number of anglers and the continuing heavy toll of game fish being taken each year. How long, they ask, can this resource stand up under such a heavy onslaught? Not only are they concerned about the angler, they are also concerned about the ravages to fish stocks caused by hydro-electric development, changing of water courses, deforestation, pollution of waters by mines, mills and manufacturing plants and by uncontrolled spewing of waste from cities, towns and villages.

Many anglers respond to encroachment on fishing waters the way a bull is supposed to respond to a red flag. Individually, or through their local fish and game clubs, they rise up in



indignation whenever their sporting rights are threatened. This is all to the good, if the claims are reasonable, for it indicates greater thought for conservation on the part of the public—even if at times the motives are purely selfish.

But the anglers—and guides—who raise their voices in protest need first to take a good, long look at themselves. For it may be found that they themselves are doing as much to endanger the future of sport fishing as the offenders they are so ready to criticize.

The fact that many once heavily populated waters are now nearly barren of fish is not altogether the fault of industrialization, for scores of these areas have never been touched by industry in any form. The answer, often enough, is obvious: they are simply fished out. This is particularly so of some of our trout streams; it is the case also of lakes that once were heavy producers of lake trout, bass and pickerel. Even the prolific pike, a creature not easily destroyed, is in some waters vanishing under the constant pressure of angling.



A boatload of happy fishermen in the Lake of the Woods district of western Ontario.

One of the biggest factors in the decline is the desire of anglers to get their full bag limit. All too frequently anglers return with catches so big that the job of disposing of them poses problems solved only by distributing the excess among friends or dumping it into the garbage can. The first method is based on a mistaken idea of neighbourly duty, the second is criminal waste of good food.

There are, of course, some waters still capable of sustaining prolonged, intensive fishing; there are others where unrestricted killing of certain species would serve useful biological purposes. Such an example would be the removal of pike, perch and other coarse fish from a lake where trout propagation is desirable. Another example would be the cleaning out of some areas where overcrowding has caused populations to become stunted and thin. The latter condition, biologists are finding, is surprisingly prevalent in

many North American waters and much attention is being given to the theory that, in fact, there should be a liberalization of the regulations. Much further experiment is necessary, however, to prove the merit of broad application of this theory.

Nevertheless, there is still much basis for the argument that there are fished-out areas. And in such instances, particularly where desirable species are concerned, catch and size limits are essential. Where this applies, the imposition of regulations is not enough. What is needed is a new standard of conduct among anglers themselves.

Perhaps it is important to realize, first of all, that fish is one of the most nutritious foods that man can eat. No other food supplies such a rich combination of fat, vitamins, minerals and proteins. This applies equally to the lowly blue gill and to the aristocratic rainbow. Its value as



Fishing at Point Wolf River in Fundy National Park on the New Brunswick coast.

food should rank before its value as a means of recreation. Waste of such food is wrong and is a violation of the true sportsman's idea of good citizenship. The angler who has the welfare of the resource, and the welfare of his country at

heart, will never wilfully take more than is necessary for his reasonable needs.

Quotas set by law are generous, certainly broad enough to allow everybody their share and enough sport to justify the high cost of



Sportsmen are flown to fishing lodges on remote lakes from St. Jovite, Quebec, the aircraft returning for them on a specified day.

their recreation. Take, for example, the Atlantic salmon. In open New Brunswick waters, the regulations permit the killing of thirty fish (by fly-fishing only) per rod each week. If the angler takes his limit and if the average fish weighs ten pounds, he has a total take of 300 pounds. Admittedly, one would have to be an accomplished angler and to have superlative luck to acquire such a bag, but the question is still a real one. What would one person do with so many fish? Or even half that number?

Any change in the laws to reduce the size of the legal catch would arouse too much ill-feeling from tourist fishermen, local anglers, leaseholders and clubs. The answer can be found only in the individual's own sense of sportsmanship. Happily, a higher concept of sportsmanship is being demonstrated to an increasing degree each year—but perhaps more by fly-fishermen than by any other group. It is the concept that the limit must never be violated, that all fish in excess of those that can be eaten will be returned, if uninjured, to the water. Many anglers use, and promote the use of, barbless hooks; others insist on the use of light tackle, particularly fine leaders, for these give the fish a chance to retain their freedom and at the same time provide thrilling sport.

Special reference is made to the Atlantic salmon because these splendid creatures—like their Pacific cousins—are well worth every effort that can be made to preserve them. And they can be preserved in sufficient numbers to assure their perpetuation for generations to come if there is continued co-operation from the industry and from the general public. Poachers and irresponsible adults who attack

salmon in exposed spawning grounds for no logical purpose, deserve whatever appropriate punishment the courts can administer. The commercial fishermen also have a responsibility, for great harm can come to the resource if they ignore the regulations governing closed seasons. Much can be accomplished with these groups by means of education, and in this connection the educational work of federal and provincial authorities, and of fish and game clubs, is doing a great deal to help.

A problem that is becoming more and more of a headache to the fishing industry, and to federal and provincial authorities, is the appalling mistreatment of fish caught by anglers. Anglers, as a rule, like to extoll the virtues of fish as food and to rave over the various species as epicurean delights. But what is brought back to their own families, or dumped into the larders of friends, is frequently unfit for human consumption.

Fish is one of the most delicate of all foods, and is almost as perishable as milk. Therefore it requires the greatest of care from the moment it leaves the water to the moment it enters the frying pan, the oven or the broiler. Yet too many anglers seem to be only vaguely aware of the rudiments of quality control; this ignorance is remarkable when compared with the time and effort devoted to acquiring their angling proficiency and when compared with their own investment in gear and equipment. The angler who makes a gift of poor quality fish to his unsuspecting neighbours actually is working against the efforts of those who are striving to increase the consumption of commercial products. No amount of culinary skill can restore the original fine flavour and delicate texture of

CONSERVING OUR GAME FISH

fish once they have been lost through mishandling. The housewife who receives such a gift, therefore, and discovers that after all her efforts she has failed to produce an acceptable meal is naturally going to develop a resistance to fish generally. The commercial fisheries, as a consequence, suffer notwithstanding the top grade products that are being marketed.

Proper care of fish is not difficult and involves little more than common sense, along with a little effort. Excellent information on fish handling is readily available from numerous sources. The federal Department of Fisheries at Ottawa has for free distribution all the facts an angler needs to know, and most local fish and game clubs are also able to offer good advice. The angler who takes the time to study the methods of proper fish handling, and puts these methods into practice, will be rewarded out of all proportions to his efforts by new experiences in fish eating.

More than one quarter of the total Canadian-United States population make up the great fraternity of fresh-water anglers. It is a fraternity in which the bank president becomes the friendly neighbour of the department store clerk; the greaser at the corner garage, the confidant of the head of a billion-dollar corporation. Angling is a pursuit whose unwritten laws forbid class distinction but which, traditionally, holds inviolable (for those who want to use it) the right to honest deception in recording lengths, weights and other equally remarkable characteristics of the prizes brought to gaff.

Good anglers there are, and poor ones. But the serious Waltons, Cottons and Gordons are much more than expert in their art; they are students of nature as well, with a knowledge of the streams and the creatures in them. To them, also, an understanding of entomology is as essential as an understanding of ichthyology.

The good angler—the man who carries on the pursuit long after the season's end and the tackle is put away—turns to his books to learn more of the mysteries of the insect and aquatic worlds which provide the food and environment necessary for the survival of fish. The good angler understands the meaning of the

Mayfly hatch and can talk knowingly of limnology, thermoclines, and scale counts. He is a specialist, and because he is a specialist the Gentle Art has for him a rich sense of satisfaction.

Most anglers belong to that great horde of people who know little of the way of fishes but who, nevertheless, derive from the sport a full measure of its gifts of relaxation and peace of mind. To them fishing is a recreation, a release from the pressures of life, a means of capturing, if only for a day or a week-end, a tranquillity not found in the cities or on the open highways. They, too, are enthusiasts.

Angling has long been an important part of the North American way of life, and the threat that faces it should be of real concern to every fisherman—from the purist who disdains everything but the fly rod to the child with the bent pin. The joint problems of conservation of fish and handling of catches can be solved only by understanding and co-operation; but they are problems that require immediate attention. No more tragic mistake can be made than to regard fish as an inexhaustible resource. Like any other resource there is a limit to the pressure it can withstand. Only when sports fishermen themselves show leadership in conservation will this threat be fully removed.



A young salmon caught in the Southwest Miramichi River of New Brunswick.



Photographs courtesy National Museum of Canada



A Ceremonial Palette from Saskatchewan

by DOUGLAS LEECHMAN

SCATTERED here and there through the Canadian plains have been found various round, oblong, or rectangular stone plates, more or less elaborately decorated. The example illustrated here, made from a gritty schist, was found near Viscount, Saskatchewan, fifty miles southeast of Saskatoon. It is about six by eight inches in size and roughly an inch thick. The human hand, which appears on the reverse side, is clumsily incised and not nearly as well done as are designs on specimens from the southern United States, where such objects are comparatively common and most painstakingly made, often carved with intricate designs showing human skulls, rattlesnakes with horns or wings, spiders, human hands, human eyes, or human faces, often with tears falling from the eyes.

Many of them are circular with a raised rim all round, and with notches cut in the edge at

regular intervals. Many have designs on one side only, rather than on both sides as in this case.

The actual use of these objects has long been in doubt. The fact that they are nearly always made of sandstone or some other gritty rock seems to support the suggestion that they were used as palettes on which to prepare face paint, and in some cases remains of pigment have actually been found still on them. Further, because they are so carefully made and were frequently buried with the dead, it seems probable that their use was ceremonial. It is generally thought that they are connected with an aboriginal religion, widespread in the central North American plains, known as the Buzzard Cult, or the Southern Death Cult. It would appear that the influence of this religious system reached as far north as the Canadian prairies.

THE CANADIAN GEOGRAPHICAL SOCIETY ANNUAL GENERAL MEETING

The twenty-fifth Annual General Meeting of The Canadian Geographical Society was held on 18th February, 1954, in the Lecture Hall of the National Museum of Canada, Ottawa. The President, Air Marshal Robert Leckie, took the chair.

After approval of the minutes of the twenty-fourth Annual General Meeting, the President opened the business proceedings with a report on the Society's activities during 1953, in which he said:

This year the Society is celebrating its first quarter century of successful endeavour to promote and disseminate geographical knowledge, and to make Canada better known to Canadians and to the rest of the world. We may look back with justifiable pride on the progress made since the inception of this Society and we have good cause to be grateful to those distinguished scientists and geographers who have so worthily aided us in the support of our constant aim.

Although there is always the closest co-operation between our Society and the various federal and provincial government departments, we are under no financial obligation to any department and stand in a position of entire independence.

Our main activity, the publication of the Canadian Geographical Journal, now in its 48th volume, reached a new milestone in its Coronation edition, published in August, which makes a permanent souvenir of the great events not only at Westminster but from coast to coast all across Canada. By gracious consent of Her Majesty, three copies of the Society's Coronation issue were despatched to Buckingham Palace through the courtesy of Government House, and a letter of acceptance was received from Her Majesty's Private Secretary.

You will have noted the new format of the Journal, inaugurated with the October issue, and I am pleased to report that this change, adopted for financial and other reasons, has met with a very favourable response from our advertising friends, and this will be reflected

more and more in future issues. The standard of the Journal will be maintained.

Our reprint services are in increasing demand. A further quarter million reprint booklets, covering sixteen topics, were published by the Society for clients and distributed by them throughout Canada, the United States and other parts of the world. This brings the total number of booklets published (other than the Journal) to well over five million, covering more than a hundred topics.

Since our last annual meeting, eight new Fellows have been elected. They are:

Major-General D. C. Spry, Director of the Boy Scouts International Bureau, London, England.

Major-General R. H. Keefer, General Manager Eastern Area, Bell Telephone Company of Canada, Montreal.

Mr. Paul Horsdal, Ottawa.

Major-General W. H. P. Elkins, Kingston.

Professor J. A. Jacobs, University of Toronto.

Mr. L. S. Mackersy, President, Imperial Bank of Canada, Toronto.

Sir William P. Hildred, Director General, International Air Transport Association, Montreal.

Mr. R. Gordon Robertson, Deputy Minister of Northern Affairs and National Resources, Ottawa.

We take pride in the fact that no less than thirty-two of the original Fellows of the Society have given us their continuous support for our twenty-five years of operation.

During the year the Society granted six scholarships, valued at \$250 each, which were applied in the Departments of Geography at the Universities of Toronto, Montreal, British Columbia, McMaster, and McGill Summer School. The successful candidates were: Miss J. I. Debrecen of Vancouver; Miss O. I. Myers of Hamilton; Mr. J. P. St. Pierre of Ottawa; Mr. J. K. Stager of Preston, Ontario; Mr. G. S. Tomkins

of Montreal; Mr. J. H. Warkentin of Winnipeg.

The field of Arctic research was supported by a grant of one thousand dollars from the Society's research fund to Colonel P. D. Baird, leader of the Baffin Island Expedition under the auspices of the Arctic Institute of North America. The main object was to study Penny Icecap, the second largest ice area on Baffin Island, and also to supplement the work of the 1950 Baffin expedition to which our Society had also made a substantial financial contribution. An illustrated article about this expedition will appear in the March issue of Canadian Geographical Journal.

On the 8th of October our office was the scene of a brief ceremony when 6,700 copies of the Canadian Geographical Journal were presented to Brigadier A. F. B. Knight, Vice Adjutant General of the Canadian Army, for transmission to our troops serving overseas, thus continuing the policy adopted during the war years when ten thousand copies a year were sent to the services.

In November we were very glad to make the announcement of the award of the Coronation Medal to our Executive Secretary and Editor, Mr. Gordon Dallyn. We warmly congratulate him on this well merited distinction.

The first week in December saw the publication of the book "Image of Canada" compiled, following discussions with the editorial committee, by our assistant editor, Miss Malvina Bolus, from illustrations used in the Journal and other Society publications. The work, published by The Ryerson Press, forms a striking pictorial presentation of Canada. His Excellency the Governor General, Honorary Patron of the Society, kindly contributed a foreword, and Mr. Wilfrid Eggleston added a most illuminating introduction. The arrangement of chapters, the selection and grouping of the pictures, the informative text and descriptive titles, involving as they did many months of research, provide a realistic picture of the Canadian scene. The Society is proud to make this further contribution to Canadian literature and

we are happy to congratulate Miss Bolus on a job well done.

By arrangement with the appropriate government department, the Society has been classified so that donations made to the Society by those interested in promoting its objectives may be claimed by the donors for exemption from income tax.

Corporate members have received notice about a proposed amendment to the By-laws of the Society regarding the different categories of membership. Further consideration is being given to this matter and it will therefore be left in abeyance.

In closing I am happy to announce officially the purchase by the Society of a house at 54 Park Avenue, near the National Museum; a home to which we hope our members will come, where there is a comfortable reading room for their use.

As President I should like to thank the members of the Board of Directors for their valued services; and on their behalf to express our appreciation to the hardworking editorial committee, and to the Executive Secretary and Editor and his staff for their devoted attention to furthering the Society's objectives.

At the conclusion of the business proceedings the President introduced the guest speaker, Dr. R. C. Wallace, former principal of Queen's University. Dr. Wallace has been associated with the Society during the twenty-five years of its existence, being on the Board of Directors continuously since formation of the original Board in 1929, and being elected a Vice-President in 1938, in which capacity he has served the Society ever since.

The speaker was thanked, on behalf of the Society, by Dr. F. J. Alcock.

Immediately after the General Meeting, a meeting of the Board of Directors was held. Officers of the Society were re-elected for the ensuing year and Standing Committees were appointed.

The address by Dr. Wallace, in part, follows.

Some Reflections, Geographical and Otherwise

by R. C. WALLACE

I welcome the opportunity, as a very inactive vice-president of this Society, to tell the editor of the Journal and his staff how much I have enjoyed the high quality of the publication, which is after all the main link with the Fellows and Members of the Society, scattered as they are far and wide. I am not unaware of the valuable work which is being done to encourage geographical research. The high quality of the articles which appear in the Journal is in itself a guarantee that the research which the Society fosters will result in work of an equally high standard. In no inconsiderable measure, through the stimulus of this Society, the departments of geography that have developed so rapidly in our Canadian universities find a medium of contact in the co-operative training of young men and women to take up the challenge that awaits them in our widespread Canadian terrain.

Geography is a description—and appreciation—of earth forms. In the short space of a lifetime it is given few to obtain more than a passing acquaintance with very limited areas of the earth's surface. Those few are fortunate indeed. I do not number myself among them. But to all of us there are scenes that linger in the memory, and kindle the imagination in our moments of reverie. May I trespass on your forbearance this evening by recounting some aspects of nature that have meant much to me, to the end that I may endeavour to discover the particular quality of these scenes that has caused them to register indelibly through the years.

In my mind's eye there is the picture of Iona, the holy isle, a haven of peace; the full moon over Arthur's Seat, lighting the great trench in which lie the Royal Mile and Holyrood Palace; dark Lochnagar overhanging the valley of the Dee, where Royalty escapes for a breath of Highland air; the great fertile strath of the Tay, over which the statue of Wallace stands guard; the cliffs and the sea and the sky of the Orkneys, beautiful in summer and magnificent

in the storms of winter; the soft velvety light of the summer midnight hour in these same isles, too fragile for description; the headwaters of the Yorkshire River Aire welling out from the limestones of the Pennines; the rich mellow colour of the Cotswold stone; the unforgettable beauty of the South Downs in spring; the vivid green of the Irish countryside as one descends from the air on Lough Neagh; the gaunt Brocken and its spectre in the Central Harz, the home of witches; the quiet peace of the Bodethal as one descends from the Brocken; the soft contours of Thuringia, hardly a fitting foster home for Luther's defiant proclamation; the storied Rhine at Bingen; the stately setting of Dresden on the Elbe; the delicate columns of lava in the Azores; the spectacle of the Peace and Smoky rivers where they come together; the Rockies as seen from the east tipped by the morning sun; the unbelievable green of Emerald Lake; the symmetry of Mount McKinley, the monarch of the continent; and of many northern lakes, fringed with the deep green of the conifer and the lighter green of birch and poplar, and the sun going down across the lake in a blaze of glory; York Factory and the memorial window to Sir John Franklin, who first set foot on this continent at York Factory; the port of Churchill, and three grain boats coming in together from the east on an early Sunday morning; the matched green and red of Prince Edward Island; pre-revolutionary Williamsburg, Yorktown and the James River; the great section into the earth's crust at the Grand Canyon; the towering sheer granite cliffs on either side of the Yosemite Valley. These stand out in memory. There is so much that remains, and may always remain unseen, except in imagination; the wilds of Connemara or of County Kerry; Tyrol and the Dolomites; the setting of Florence which nurtured the golden age of Italian art; the great Rift of central Africa; Samoa and the spirit of Robert Louis Stevenson; the dead heart of Australia. There is so much to see; so little time to see it.

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Why have these scenes registered so clearly in my memory? Not in the main, I think, because in so many cases they have a history that intrigues. One thinks of the cliffs of the Orkneys, laid down so long ago in inland seas teeming with strange fishes that have left perfect fossils, so exciting to Hugh Millar and his successors. One meditates on the amazing persistence of the Peace River in cutting through a mountain system rising continuously as though to defeat the efforts of the river to keep its channel, while the Smoky River, no mean stream, had perforce to confine itself to the more humdrum task of eating into the eastern slope of the foothills. The mind travels forward to the time when York Factory may become completely inaccessible from the sea, for the coastline seems to be rising a metre for every hundred years. One contemplates with wonder akin to awe the work of the Yosemite River in cutting deep down through the hard granite on either side to form the impressive cleft of the Yosemite Valley. All this background, and more, plays a part, but not the significant part, in the contemplation of these scenes of nature, even if one has been trained and accustomed to think back over long periods of time.

Nor has the influence of man played a great part. In so many cases in my portfolio of memories, nature has been untouched by man, and in only a few has man counted. His selection of building stones has made the Cotswolds a joy. The deft pen of Jacquetta Hawkes in *A Land* has brought before us impressively what the wise use of building stone has meant for England. The Brocken is what it is partly because of the legend of the witches' dance on Walpurgis Nacht. The intriguing attraction of Churchill lies in part in its human history, in part in its hopes for the future. Arthur's Seat looks down on Holyrood, and the scene would lose much if the romantic story of Mary of Scotland were obliterated. But these are incidentals. The great massive face of nature is too strong to be remoulded by man's puny efforts.

No, we have to search for some-

thing deeper than the story of origin, or the influence of man in this strange attraction that nature has over us. Partly it is a sense of permanence. True, all nature's forms are passing—but passing only when the measuring clock beats thousands of years instead of hours. In our short lifetime the cliffs remain as we know them. We revisit them knowing that we will find them as friends of boyhood days, unchanged. Our school companions are gone, or have changed almost beyond recognition, as we have changed in their eyes. But the old familiar places welcome us with outstretched hand, and we are once again at home. They speak to us in a language that we know. They give us strength to go on. "I will lift up mine eyes unto the hills, from whence cometh my help".

And there is a beauty that speaks to the soul. The poets and the artists have felt it, and have endeavoured to interpret the inner beauty of nature to receptive hearts all through the ages. This is the avenue, more than any other, through which we make contact with the power behind the universe. There are few among us who can lose ourselves in the beauty of a sunset, or in the soft radiance of moonlight over a lake, without feeling lifted up to something higher and greater than ourselves. "The heavens declare the Glory of God; the firmament showeth His handiwork."

Into this intriguing world man has come, concerned to find for himself sustenance so that the human race may endure. A clergyman-schoolmaster in the latter part of the eighteenth century, Thomas Malthus, felt that the increase in human population would eventually outrun the increase in food supply, and famine and starvation would ensue. He did not realize how often his words would be repeated in the next century and a half. Ricardo based his system of economics on this prediction. Darwin obtained support for the principle of the survival of the fittest from this need to struggle for the crumbs that will be left. It was a simple step forward to argue that a dominant race alone would survive, for it would control available supplies by the strength of its right

arm. That race would—so it was felt—be the Nordic race. And today the ghost of Malthus still walks. The world's population is increasing considerably faster than are our food supplies. In this land of food surpluses, it is not easy for us to realize this stark fact. The possibilities of occupying new fertile territory on our planet are small. The Peace River district, so loudly acclaimed, gives very limited opportunities for expansion. The newer surveys of the Amazon territory are not encouraging. Central Africa may provide more possibilities if the native population can be trained to more scientific methods. But we have already almost possessed the agricultural regions of our planet. Our population grows rapidly, and there is little likelihood, over a great part of the earth, that it will be appreciably affected by birth control limitation. Surely we do not have to call in devastating wars to our aid to decimate the human race. We hope at last that we have outgrown this crude but very effective weapon.

Here then is a task to challenge the resources of our economic geographers. It is on our doorstep if our door, as it should, opens out into the whole world. It demands an answer, and in our own time, not generations ahead. You may have felt that I have been wandering in somewhat mystical and uncertain territory in my thinking with you this evening. You may even have thought that I was sometimes lost in the clouds. You will agree that I have at last come down solidly to earth.

* * *

EDITOR'S NOTEBOOK

P. D. Baird (*Cumberland Peninsula of Baffin Island*) is Director of the Montreal office of the Arctic Institute of North America. He is a glaciologist, and for his explorations in the Canadian Arctic he was awarded the gold medal of the Royal Geographical Society.—The Rev. R. M. Bennett (*Irrigation and India's Food Problem*) was connected with the Indian Army for seven years as an engineer officer. He also worked as a missionary in India and is now interim secretary to the Canadian

Baptist Foreign Mission Board.—
Frank H. Ellis (*The First Non-stop Atlantic Flight*) started work on aviation by building a plane and teaching himself to fly. After serving in World War I he took up commercial aviation in Canada. He now lives in West Vancouver and is an authority on pioneer days of aviation.—
F. H. Wooding (*Conserving our Game Fish*) is Director of Information and Educational Service in the Department of Fisheries at Ottawa. He is a leading authority on commercial fisheries and has written extensively on the subject.

* * *

International Union of Geographical Associations

The second International Conference of Teachers of Geography will be held in the Netherlands from August 22nd to 29th, 1954. The program, with details of meetings, excursions and costs for accommodation is available from the organizing secretary, Professor A. C. de Vooy, Drift 21, Utrecht, The Netherlands.

It is hoped that as many teachers as possible, representing most countries in the world, will attend this conference, which promises to be an outstanding success. Sections are being arranged for the separate discussion of problems related to the teaching of geography in all types and grades of schools and institutions.

* * *

AMONGST THE NEW BOOKS

Map and Landscape

by Dorothy Sylvester

(George Philip and Son Ltd.,

London, 1952. 25/-)

This very practical book is essentially an aid to work in the field. It is divided into three parts—the grammar of map reading and field work; map and field study of geographical features, and the three-dimensional study of landscape. For the geographer preparing to make a regional survey, the second part is particularly useful. Some of the topics it discusses are general methods for studying physical features, schemes for the study of some landscape types and the study of regional economic geography and urban and rural settlements. The use of photographs is also mentioned, although a whole chapter in the third part of the book is devoted to the relationship of the landscape photograph and the map.

The illustrations in the book consist mostly of sketch maps and diagrams. There are some eighty of them. Uncluttered with non-essential

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Donations to the

CANADIAN GEOGRAPHICAL SOCIETY

The Canadian Geographical Society is pleased to announce that the Department of National Revenue, Taxation Division, has recognized the Society as a charitable organization for the purposes of the Income Tax Act.

Donations made to the Society, when evidenced by a receipt, may be claimed as a deduction by the donors in computing taxable income subject to the provisions of Section 27(1)(a) of the Income Tax Act.

Payments for membership or other fees, or where any right, privilege, material benefit or advantage may accrue to the donor, are not deemed to be donations.

Unless anonymity is requested by the donor, all donations will be publicly acknowledged in the Canadian Geographical Journal.

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(Continued from previous page)

detail and most aptly chosen, they are a revealing lesson in the effectiveness of the author's principles in practice. Although most of her examples are from Britain they are not exclusively so. Indeed, there is a special section on foreign maps together with eight plates in full colour of large scale maps from various parts of Europe.

Field work at the school level in Canada is often neglected because of the problems associated with arranging such undertakings. Consequently Miss Sylvester's appendices on materials required for practical work and her notes on the organization of field trips should have a special appeal to teachers of geography. She has included those essential, yet seldom stated, details of financing such excursions and, with the realization that a field party travels on its stomach, even discusses the final arrangements for tea!

NORMAN L. NICHOLSON.

* * *

What the World Showed Me

by Per Høst

(British book Service, Toronto, \$4.00)

This is a pleasant book about the miscellaneous adventures of a Norwegian zoologist. Each chapter is interesting and well told in excellent translation, but as a whole the book lacks coherence and plan. That is not really the author's fault, for he had a very definite plan in life from his school days onwards, and that was to go and study natural history in New Guinea. This never happened and he had to make do with what happened instead. His first job took him as far away from New Guinea as possible; he was sent by the Norwegian government as zoologist into the drift ice north of the White Sea to collect biological data concerning the sealing industry. On one of his many trips he came in for an exciting brush with the patrol ships of the Soviet Union who protested that the Norwegian sealers were within the Russian twelve mile limit. However the practical difficulties of impounding the little Norwegian vessels in those frozen waters saved the day.

Mr. Høst was unable to get financial support to carry out the results of his biological findings, so he went to the United States where he was most unexpectedly asked to join an expedition to New Guinea but just as his boyhood's dream seemed within grasp, permission was refused by the Dutch authorities and it became necessary to seek other work. The American Museum of Natural History sent him on a scientific investigation of wild life in the Everglades of Florida where poisonous snakes, white ibis, and alligators were his constant companions.

After his war service, Mr. Høst went to Panama where he came in contact with the two independent Indian tribes, the Choccos and the Cunas, for whose friendliness and simplicity of life he felt genuine admiration. He spent much time with them to study their free and happy community and he also used his camera to exceptional advantage. His colour photography pictures deserve the highest praise and add greatly to the charm of this entertaining book.

S. SEELYE

Maps and Map-Makers

by R. V. Tooley

Second Edition Revised

(Crown, New York, 1953, \$7.50)

The title of this book may be somewhat misleading for it is really about "old" maps—a study of map-making from the earliest times to the nineteenth century. This explanation is not intended to deter the reader however, for *Maps and Map-Makers* would be an absorbing volume even if the lavish illustrations were its only unique feature. There are over one hundred of them, mostly full-page plates, many of which are in colour. They were chosen to exemplify the work of the principal cartographers and map publishers, although one is apt to become too engrossed in their attractive details to remember this.

The book is arranged according to "schools" of cartography—"the Classics, Italian, Dutch, French, and English, with brief notes on the principal map-makers in each group and a list of their main productions". As such it is a preliminary guide to students to whom the bibliographies should have a special appeal. Canadian cartology is directly represented by Captain Carver's famous map of the Province of Quebec of 1776, and indirectly by such items as the Contarini World Map of 1506 (the earliest printed map to show America), and the 1847 Levasseur Map of North America.

While the book is especially useful to the historical geographer and the bibliophile, anyone who is artistically curious should also be attracted to it. NORMAN L. NICHOLSON

* * *

Woodsmoke

The Book of Outdoor Lore

by Ellsworth Jaeger

(Macmillan, Toronto, \$3.35)

There must be dozens of books on camp craft available but I have seldom encountered one as satisfactory as this one is. First of all, the information is potentially useful. There are no complex directions for doing something that you will never want to do. Secondly, it is thoroughly illustrated with clear and explicit drawings that really do illustrate, rather than decorate.

Perhaps the book's excellence may be attributed to the fact that it is directly based on the personal experience of the author, and Ellsworth Jaeger has had about as much practical experience in this field as anybody in the country. He has written and lectured on living out of doors for years, and has practised it himself in Mexico, the United States, and Canada for much of his life.

Wild foods are adequately treated, whether meat, fish, or vegetable, as well as the ways of catching them first. Instructions are simple and direct, and there's an index for quick reference. Many of the recipes and bits of lore are based on Indian practice, and this too is firsthand stuff. I was surprised and delighted to find my friend Walking Buffalo on page 6, a Stoney Indian from Morley, Alberta, giving directions for building a sweat lodge. Altogether, it's a book that all camping enthusiasts will want, both for their own use and to present to others.

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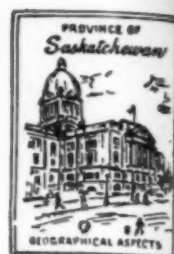
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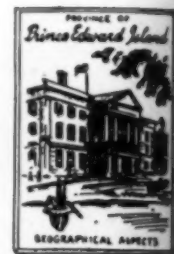


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The Creation of the Universe

by George Gamow

(Macmillan, Toronto, \$4.75)

This book is the third of a trilogy dealing with the problems of cosmogony. It is not concerned with so small a matter as our own particular planet, but seeks to discuss whether our universe ever had a beginning in Time and whether it has an end in Space. The author explains his belief that the present state of the universe results from a continuous evolutionary process, while others believe in a constant creation of matter in intergalactic space to maintain the hypothesis of a "steady-state" universe. It is only within the last twenty-five years that enough has been gathered from atomic physics to make any mathematical study of the expansion of the universe, a process which seems likely to continue into infinity. This book is intended for the astronomically minded layman; the purely technical formulae, "for the benefit of those who know how to use them" may be found relegated to the end of the book.

S. SEELEY

* * *

Sainte-Marie Among the Hurons

by Wilfrid and Elsie Jury

(Oxford University Press, Toronto, \$3.50)

Few students of Canadian history can have hoped that the site of Sainte-Marie-aux-Hurons, the first inland European settlement in North America, would ever be so completely excavated and so carefully described as it is here. Its precise location was always known

and plans of the ruins had even been drawn at different times; indeed, some archaeological work had already been done on the site, but it remained for Wilfrid and Elsie Jury and an enthusiastic and hard-working group of volunteers and students to lay bare the ground plan of the whole settlement. They were aided in this work by the University of Western Ontario and the Society of Jesus who lent every assistance.

Their discoveries were astonishing. Probably nobody had quite realized the extent of the Jesuit Mission to the pagan Hurons that stood here for ten years, from 1639 to 1649, and was at last burned to the ground by the very people who had built it with such care and toil. All materials of European origin, everything except local wood and stone, that was needed to build and maintain the Mission, had to be carried over a canoe route eight hundred miles long with some forty or more portages, and it was in the face of such obstacles as this that the devoted missionaries brought in calves and heifers, pigs and chickens, seeds of flowers and vegetables, tools and equipment for their farm, their residences, their workshops, and their hospital.

They built barracks for soldiers, a chapel for the use of the Europeans of whom there were sometimes sixty or more in residence, a church for the Indians of whom there were often many more, houses for these people to live in, bastions and a strong double palisade for defence, a well, an aqueduct, a canal with skilfully built locks and a roofed loading basin, and even an escape tunnel leading down to the river bank. The canal was undoubtedly the first

such structure to be built in North America and it was no puny affair, but a useful channel 355 feet long that enabled the builders to float stone and timber right to the site of construction.

It is needless to describe the site in detail, in fact it would be too long a task, but the book itself should be consulted to see, not only the great extent of Ste-Marie, but the enormous amount of painstaking work that the Juries and their fellow excavators accomplished and the care with which they have described and interpreted the remains they found. Their work has thrown an entirely new light on the site, and had the digging not been done so meticulously, their conclusions might well have been open to attack. As it is, there can be little if any doubt as to the accuracy of their observations and deductions.

The story of Ste-Marie-aux-Hurons is almost incredible, a story of devoted courage, endless toil and hardship, and agonizing martyrdom. It was near here that Laleman and Brebeuf died their awful deaths, and nearby also is Christian Island where the missionaries next established themselves for a short time, and which the Juries hope soon to excavate.

The book itself is well done, the plates and illustrations are excellent, and the writing succeeds in making very real and vivid one of the most extraordinary episodes in the history of Canada or, for that matter, in the history of any country. It is an accomplishment of which the Juries, the University of Western Ontario, and the Jesuit Order may well be proud.

DOUGLAS LEECHMAN